WHEN INNOVATIVENESS IN FORM MATTERS: THE JOINT IMPACT OF FORM INNOVATIVENESS AND EXPECTED INNOVATIVENESS TYPE ON PRODUCT EVALUATIONS OVER TIME

A Dissertation

by

MICHAEL WILLIAM KROFF

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2006

Major Subject: Marketing

WHEN INNOVATIVENESS IN FORM MATTERS: THE JOINT IMPACT OF FORM INNOVATIVENESS AND EXPECTED INNOVATIVENESS TYPE ON PRODUCT EVALUATIONS OVER TIME

A Dissertation

by

MICHAEL WILLIAM KROFF

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Approved by:

Chair of Committee,	David M. Szymanski
Committee Members,	P. Rajan Varadarajan
	William M. Pride
	Steven Smith
Head of Department	P. Rajan Varadarajan

May 2006

Major Subject: Marketing

ABSTRACT

When Innovativeness in Form Matters: The Joint Impact of Form Innovativeness and Expected Innovativeness Type on Product Evaluations over Time. (May 2006)

Michael William Kroff, B.S., Brigham Young University;

M.B.A., Brigham Young University

Chair of Advisory Committee: Dr. David M. Szymanski

Past research in the area of product innovativeness has been dominated by studies conducted at the firm level. Furthermore, these studies principally lack a consumer perspective on the product innovativeness – product performance relationship. The purpose of this dissertation is to explore three seemingly critical questions regarding the impact of product innovativeness dimensions on the evaluation of innovative products at the individual level: (i) how do consumers evaluate and respond to different types of product innovativeness? (ii) do these evaluations change over time?, and (iii) under what conditions is change most likely to occur? Specifically, new visual design features (i.e., form innovativeness) and new non-visual features (i.e., function innovativeness) are empirically tested to understand how they interact and relate to new product evaluations. Within this research, attitudes and behavioral intentions toward products with innovative features are measured over time to assess how and when they might change.

Two experiments were conducted to empirically test the impact of form innovativeness on functionally innovative products over time. Participants in both experiments received multiple exposures to innovative products, rating their attitudes and behavioral intentions toward the products after each exposure. Participants in the first

experiment saw a visual representation of the products only once while those in the second experiment saw the products during each exposure. Results from two experiments suggest that form innovativeness does indeed have a changing impact on the liking of innovative products. Furthermore, this change is moderated by the product's visual presence or absence. Finally, this change occurs when innovativeness in form is applied to either a form product or to a function product.

DEDICATION

To my wife and queen - Donna

ACKNOWLEDGMENTS

First and foremost, I must acknowledge the unwavering support I received from my wife, Donna, and my four children, Zachary, Hayden, Maddy, and Trevor. They not only showed amazing patience with me and the many hours I spent away from them, but also provided an invaluable respite from what sometimes seemed to be never-ending work. It is because of them that I took on the task of completing a doctorate and it is because of them that I was able to finish.

I would like to thank my committee chair, Dr. Szymanski. His wisdom and patience were critical to the completion of this dissertation. He guided me through all phases of the dissertation process with critical insights and suggestions that improved my work and helped me avoid costly mistakes. His confidence in me and my ability to see the dissertation process through to the end meant more to me than I can express. I would also like to thank him for allowing me to work on other research projects with him. The lessons I learned from him in creating clear and meaningful research is invaluable.

I would also like to thank the members of my committee for their insight and encouragement throughout the dissertation process. Dr. Pride not only provided valuable insight but also provided emotional support through this long process. He always had an encouraging word and I always left his office more confident than when I had entered. Dr. Smith was also a major support with his knowledge in cognitive psychology and experimental methods. He always had insightful questions to ask regarding my overall research and the methodology that I might employ to answer my research questions.

Finally, I would like to thank Dr. Varadarajan for his help, not only as a member of my dissertation committee, but also as the head of the marketing department. He was

extremely fair with me and the other doctoral students in my cohort. His abilities as both a researcher and a leader are well known but should be acknowledged here. I am grateful for his efforts to improve both my dissertation and my experience as a doctoral student.

TABLE OF CONTENTS

CHAPTER Page

Page

LIST OF FIGURES

LIST OF TABLES

TABLE Page

CHAPTER I

INTRODUCTION

> Most companies' managers will tell you that they have spent the bulk of their time over the past decade on improvement. Now it's no longer enough to get better, you have to "get different."
>
> - Roger Martin, Dean, Rotman School of Management, University of Toronto (Byrne 2004, p. 18).

An increased emphasis on product innovativeness is evident in both the contemporary and academic literature. A comparison of two meta-analyses, for example, shows a four-fold increase in the number of empirical studies that included product innovativeness as a variable of interest (Henard and Szymanski 2001, Szymanski, Kroff, and Troy 2006). This increased attention is supported by researchers' suggestion that the failure of new products is partly attributable to a lack of product innovativeness (e.g., Crawford 1977; Cooper 1993, 1996).

Within the realm of product innovativeness, there also appears to be a trend in the popular press to focus on innovativeness in design as a key to new product success. Consider, for instance, the following quotes:

> Ford design chief J Mays believes that only a distinctive look and feel will give customers a compelling reason to buy what is essentially a commodity. Ford has put design at the forefront of its competitive strategy – and it's betting big that Mays has a winning blueprint for future growth (Breen 2004, p. 62).

This dissertation follows the style and format of the *Journal of Marketing.*

> Innovative new products…come from mastering the 'fuzzy front end.' They happen when a company delivers on both style and technology in a way that can provide some measure of fantasy (Hammonds 2002, p. 123-124).

Such is the reflection of the contemporary view of design's importance to the success of innovative products. Accordingly, visual elements of a product's design (i.e., product form) are becoming more important as companies seek new ways to innovate. The effects of form as a dominant innovative strategy, however, has received little attention in academic research in contrast to the notion of overall product innovativeness, which aggregates both innovation in form and function.

Contemporary literature also suggests, as evidenced in the quotes above, that there is typically a combination of *functional*, or non-visual new attributes and *form*, or visual new attributes that make up new products introduced in the marketplace. In other words, visual or form innovativeness typically occurs jointly with functional innovativeness. New automobiles, for instance, do not generally offer only new visual features. Instead, these features either compliment or are complimented by new features relating to how the automobile performs. Volkswagen, for instance, recently developed a front-centered armrest with cooled storage for its 2006 Passat. This purely functional feature is accompanied by a host of other new features including a chrome front grill frame, a feature that relates to the automobile's form (DeRosa 2005). Therefore, it seems reasonable and even beneficial to consider these two types of innovativeness – form and function – together when trying to understand their impact on overall product evaluations. This seems appropriate from an empirical perspective as long as these two dimensions can be captured independently. It also seems appropriate from a practical perspective, as it is more indicative of what generally goes on in the marketplace, that is,

firms typically innovate on both dimensions of form and function when introducing a new or improved product.

The increased emphasis on product innovativeness and the suggestion that design is potentially an effective means of innovating must be tempered by indications that attitudes and behavioral intentions toward these types of new products are not necessarily stable. A phenomenon that sometimes occurs as reported in the popular press, for instance, is that despite initial marketplace excitement, new products often fail (Appelbaum, et al. 1990; Power, et al. 1993). This issue parallels documented instances of initially favorable product design assessments that do not lead to subsequent purchasing behavior (Lorenz 1986). Complementing these marketplace issues is empirical research involving changing effects of visual novelty over time on a variety of individual responses including arousal, affect, and attractiveness (Berlyne 1960, 1970; Ortony, Clore, and Collins 1988; Zajonc 1968). This literature suggests that there is typically a decay of effects that occurs as novelty wears off. This decay may have either a positive or negative overall impact on stimulus liking. Liking may increase, for instance, if the initial arousal is excessively high and subsequently decreases to a more optimal level, or, if the novelty is "complex" causing initial feelings of uncertainty that decrease over time. Alternatively, liking may decrease over time if the novelty is "simple" resulting in boredom with the stimulus (Berlyne 1974; Bornstein 1989). Collectively, this evidence suggests that the impact of product innovativeness on evaluations of new products can vary over time due to a decay of various effects.

Despite evidence that the impact of product innovativeness on attitudes and behavioral intentions of individuals could change over time, there is little empirical

literature directly examining this issue in the context of innovative product assessments by consumers. Indeed, while research is extensive regarding the impact of overall product innovativeness on performance at the firm level (Szymanski, Kroff, and Troy 2006), only sporadic research exists at the individual level. Research conducted at the individual level has focused on consumer factors such as product evaluation processes (e.g., Olshavsky and Spreng 1996), categorization techniques (e.g., Moreau, Markman, and Lehmann 2001), and product preference (e.g., Muhkerjee and Hoyer 2001). These studies typically consider the impact of product innovativeness on a consumer's capacity to process information. What is missing, however, is research that considers the changing impact of product innovativeness on an individual's overall product liking.

Needed Directions

The relative absence of evidence regarding the effectiveness of product innovativeness as a competitive strategy and the lack of attention given to understanding how individuals evaluate innovative products suggests that there is still much to learn regarding this process. The purpose of this dissertation is to explore and begin to fill the gaps described above that exist in the academic literature regarding the impact of product innovativeness dimensions on the evaluation of innovative products at the individual level. Specifically, new visual design features (i.e., form innovativeness) and new non-visual features (i.e., function innovativeness) will be empirically tested to understand how they interact and relate to new product evaluations. Within this research, attitudes and behavioral intentions toward products with innovative features will be measured over time to assess how and when they might change. Accordingly, one can begin to assess the facets of product innovativeness that might matter most to the performance of

innovative products. To summarize, the primary purpose of the dissertation is to address the following:

1. How do consumers evaluate and respond to different types of product innovativeness?
2. Do these evaluations change over time?
3. Under what conditions is change most likely to occur?

Contributions to the Product Innovativeness Literature

This dissertation contributes to what is known about product innovativeness in two ways: First, two dimensions of innovativeness considered important by consumers, form and function, are explored and empirically tested. Innovativeness in form relates to the newness or novelty regarding how a product looks (Berkowitz 1987; Durgee 1988; Garber Jr., Hyatt, and Starr Jr. 2000). The importance of this unexplored dimension of innovativeness comes from selected research in cognitive science where visual novelty in stimuli has been shown to impact patterns of cognition, arousal, and feelings (Berlyne 1960; 1971). Innovativeness in function relates to novelty in what a product does or how it performs. Second, the interaction between these two dimensions of product innovativeness and their subsequent impact on consumers' attitudes and behavioral intentions are tested.

In sum, as the call for innovativeness across multiple dimensions becomes increasingly prevalent (Danneels and Kleinschmidt 2001; Garcia and Calantone 2002; Green, Gavin, and Aiman Smith 1995), the findings of this dissertation add value by empirically testing perceptions of dimensions of product innovativeness as seen through the eyes of the consumer. Furthermore, understanding the role of product innovativeness

in the development of attitudes and their subsequent prediction of behavior should allow for more accurate assessments of the potential success of new products.

CHAPTER II

LITERATURE REVIEW

The focus of this chapter is on the product innovativeness construct. First, a review of past literature that has included product innovativeness as a variable of interest is offered. This review is followed by an in-depth analysis of the product innovativeness construct. From this analysis, important gaps in the empirical literature regarding product innovativeness are identified, setting the stage for this dissertation's model development.

A Review of the Literature Involving Product Innovativeness

Product innovativeness is one of a variety of product characteristics that has been researched in the marketing literature. These include price (e.g., Ali, Krapfel, Jr., and LaBahn 1995), technological sophistication (e.g., Ali, Krapfel Jr., and LaBahn 1995), design (e.g., Garber Jr., Hyatt, and Starr Jr. 2000), features (e.g., Carpenter, Glazer, and Nakamoto 1994), fit (e.g., Aaker and Keller 1990), complexity (e.g., Griffin 1997), quality (e.g., Gatignon and Xuereb 1997), and product advantage (e.g., Song and Parry 1997). Characteristics of a new product, in general, are important both to the firm producing the new product and the market in which the new product will compete. For instance, from a firm's perspective, compatibility between a new product and the firm's resources and skills can be critical to the success of the new product (Calantone and Cooper 1981; Cooper 1979; Sethi 2000). From the perspective of the market, the characteristics of a new or innovative product can affect the likelihood and speed of diffusion in the marketplace (Gatignon and Robertson 1985; Rogers 1995). Therefore, information from the firm and the marketplace regarding the impact of new product characteristics on product performance is important to the success of new products.

From a firm or strategic perspective, product innovativeness, as a variable of interest, has been studied extensively in the new product literature (See Table 2.1). While researchers have focused on the importance of product innovativeness to product and firm success (e.g., Crawford 1977; Cooper 1993, 1996; Lynn, Monroe, and Poulson 1996; Sethi 2000), a synthesis of the empirical findings over the past 30 years suggests that the overall direct relationship is positive but weak on average (Szymanski, Kroff, and Troy 2006). Furthermore, the impact of product innovativeness on product choice from a consumer's perspective has received little attention in the marketing literature (see Cox and Cox 2002; Mukherjee and Hoyer 2001 for exceptions). There has been, however, research conducted on the effect of product innovativeness on consumers' capacity to categorize innovative products (e.g., Olshavsky and Spreng 1996; Moreau, Markman, and Lehmann 2001). In addition, there has been extensive research beginning with Rogers (1978) regarding the diffusion of innovations (see Mahajan, Muller, and Bass 1990 for a review). This research stream deals primarily with the attributes of innovations (i.e., relative advantage, compatibility, complexity, trialability, and observability) and how these attributes impact overall innovation diffusion. What is missing from this literature is empirical research that considers how product innovativeness itself impacts preference or resistance to new products.

While there is little direct research in this area, important clues to the impact of product innovativeness on consumers' assessments of innovative products can be drawn from the brand extension literature. First, the evidence strongly suggests that consumers prefer extensions that have a good fit with the parent or core brand (Aaker and Keller 1990; Boush and Loken 1991; Broniarczyk and Alba 1994; Keller, and Aaker 1992;

TABLE 2.1

Empirical Studies Involving Innovativeness—Performance Relationship

Panel A: Innovativeness as Newness

Author(s)	Innovativeness Defined As:	P[a]	T[b]	B[c]	Firm[d]	Market[e]	Relationship[f]
Cooper (1979)	Innovativeness relative to other products in the market	X				X	+
Firth and Narayanan (1996)	Degree of newness or innovativeness in the marketplace. Degree that core technologies in new product are consistent w/ those in firm's existing products.	X	X		X	X	+
Gatignon and Xuereb (1997)	Minor improvement in technology or large new body of technological knowledge. Degree of similarity to competitors' products	X	X			X	+/-
Meyer and Roberts (1986)	Technological newness relates to changes in key technologies of past products as minor improvements, major improvements, new-related, or new-unrelated. Market newness relates to application to existing customers, new niches, new segments, or new markets.		X	X	X	X	-
Mukherjee (1998)	Presence of novel attribute.			X		X	NS[†]
Parry and Song (1994)	Newness of technology		X		X		+
Robinson (1990)	Degree of innovation perceived by consumer when project began.	X				X	NS
Sethi (2000)	How novel the product was to the firm. Using newness scale of Booz, Allen & Hamilton (1982).	X			X		-
Song and Parry (1999)	A product's and its technology's newness to the marketplace and to the firm developing the product (p. 673).	X	X		X	X	+
Tatikonda and Montoya-Weiss (2001)	Newness of product modules, configuration, and technologies in the product. Newness of target market to firm.	X	X		X		NS
Yap and Souder (1994)	Unique product benefits and/or product class dissociation.			X		X	-

TABLE 2.1 (Continued)

Panel B: Innovativeness as Newness Plus Relevance

Author(s)	Innovativeness Defined As:	P[a]	T[b]	B[c]	Firm[d]	Market[e]	Relationship[d]
Cooper and Kleinschmidt (1987)	Construct containing unique benefits, innovativeness, problem-solving, quality, cost, and product superiority.	X		X		X	+/-
Cooper et al. (1994)	Unique benefits to the customer not available elsewhere			X		X	+
de Brentani (1989)	Replaces inferior alternative.			X		X	+
Hultink and Robben (1995)	3 types of new products- those without new usage possibilities, those with new usage possibilities, and those that are new-to-the-world (never seen before)	X				X	+
Im and Workman Jr. (2004)	New product novelty and meaningfulness relative to competition.	X				X	+
Li and Calantone (1998)	Newness to market, unique features, ease of use, increases customer's work efficiency, reliability, compatibility, functionality to customers	X		X		X	+
Ryans (1988)	Differentiation measured as the presence or absence of competitors and relative quality	X				X	+/-

TABLE 2.1 (Continued)

Panel C: Innovativeness as a Combination of Factors

Author(s)	Innovativeness Defined As:	P[a]	T[b]	B[c]	Firm[d]	Market[e]	Relationship[f]
Atuahene-Gima (1995)	Newness to customers: extent that product is compatible w/ experiences and consumption patterns of potential customers; Newness to firm: Degree of similarity w/ firm's current products (incremental – new-to-world).	X[g]			X	X	-
Atuahene-Gima and Evangelista (2000)	Newness to the firm and/or market. Reflects firm's degree of experience w/ NPD project. Measured as new to world, new to company, line extension, or product modification	X			X	X	NS
Biggadike (1977)	Degree of innovation offered by entrant firm: major innovation, incremental innovation, and similar offering.	X			X		+
Bonner, Ruskert, and Walker Jr. (2002)	New-to-the-world, new-to-the-firm, line extension, product modification, process modification (Booz-Allen & Hamilton)	X			X	X	NS
Cooper (1984)	10 point likert scale of innovativeness as part of "nature of products developed."	X					+
Danneels and Kleinschmidt (2000)	Consists of a familiarity component, a fit component, a marketing component, and a technological component from a firm perspective.	X	X	X	X		+
Link (1987)	Novelty rating on 1 to 11 scale.	X			nr	nr	+
Lynn and Akgun (2001)	Matrix consisting of 2 dimensions: market uncertainty and technology uncertainty creating incremental innovs, evolutionary technical innovs, evolutionary market innovs, and radical innovations.		X	X		X	NS
Swink (2000)	Percent of new process and product technology along with the aggressiveness in goals for product features (all to the firm).		X	X	X		+

[a] P = Newness of product.
[b] T = Newness of technology
[c] B = Newness of benefits
[d] Firm = Newness to the firm
[e] Market = Newness to the market
[f] The sign denotes a positive or negative relationship between product innovativeness and performance, significant at $p \leq .05$
[g] An X denotes the dimension(s) of innovativeness considered and measured
[†]NS = relationship not significant

Park, Milberg, and Lawson 1991). This preference stems from the consumer's capacity to transfer the affect, beliefs, attitudes, and preferences regarding the parent brand to the extension. One could argue, therefore, that there should be an inverse relationship between product innovativeness and consumers' evaluations of the innovative product. As the product becomes more innovative, it becomes more difficult to fit its similarities in features with those of a parent brand. Similarly, one could argue that innovative products should also be moderately congruent to a particular product category to allow both categorization and recognition of the product's uniqueness.

There are clear differences, however, between research on brand extensions and what is needed to understand consumers' evaluations of innovative products. First and most importantly, the new products studied in the brand extension literature have not been innovative products. Indeed, the focus has been on the variance between a brand's current product class and a particular new product that is *different*. For instance, Aaker and Keller (1990) included extensions such as McDonald's photo processing and Crest chewing gum. These types of products would be considered new to the firm but not to the market. In other words, consumers would not consider these products innovative in that they are already familiar with them. Therefore, cognitive and affective reactions to these products would seemingly be based on what is already known and felt about the brand and the familiar product now associated with that brand.

Second, the difference measured in the brand extension literature is typically between a new product and a particular brand and not a particular product category (e.g., Aaker and Keller 1990; Boush and Loken 1991). Justification for the use of brands is that a brand can actually represent a category in the mind of a consumer comprised of

those products offered by a particular brand (Boush 1993). In other words, what are being measured are the consumers' thoughts and feelings regarding a particular brand as a category rather than an assortment of similar products across various brands. While a consumer would certainly be concerned about a product being different than what is normally offered by a particular brand, it might also be important to see how the consumer feels about the new product relative to other products in the membership category or a closely related product category. Put differently, how do consumers feel and evaluate new products relative to other products within a particular category?

To summarize, there are important issues to consider based on a review of what has been researched regarding product innovativeness as a product characteristic related to product performance. First, product innovativeness has principally been studied from a market-level perspective (i.e., how product innovativeness impacts overall product performance and/or firm performance). Little research has considered it from an individual level (i.e., how consumers evaluate innovative products). Second, related research in the brand extension area does suggest that there is a relationship between the degree of fit that a new product has with a known brand and that new product's success. The products under investigation have not typically been innovative, however, but instead have been unrelated to the brand considered. Furthermore, the comparison has generally been between a new product and a known brand rather than between a new product and a product category. Finally, research conducted in the area of the diffusion of innovation has considered a variety of characteristics of innovative products that are related to product performance. These characteristics have not included, however, the

degree of product innovativeness and how it relates to consumers' evaluations of new and innovative products.

With an understanding of what has been studied in its area, an in-depth review of the construct that is product innovativeness will now be set presented. From this review, seemingly important gaps in what is known will be identified for empirical consideration.

A Review of the Product Innovativeness Construct

Within Table 2.1, various definitions of product innovativeness are noted along with a variety of dimensions considered important in measuring the construct. Directional relationships that have been found are also noted. From the research reviewed in Table 2.1, two seemingly critical issues emerge regarding the product innovativeness construct. First, various dimensions of product innovativeness have been considered (e.g., technology, specific attributes, or the product itself) across studies. Second, the perspective from which innovativeness is measured or assessed (e.g., the firm, the consumer, or both) also varies across studies. These two issues and their impact on what is known about the product innovativeness – product performance relationship are discussed next.

What Dimensions of Innovativeness are Being Rated

A review of the definitions in Table 2.1 reveals that there are three common dimensions of innovative content in the empirical literature- *products themselves*, *technology*, and *product attributes*.

The innovativeness of *products themselves* is the most common dimension of product innovativeness in the literature (see Table 2.1). In theory it is measuring the product as a whole relative to other products. It allows respondents to consider all

aspects of the product and rate them relative to those of other products. A potential concern when rating overall product innovativeness, however, is that one does not necessarily know the specific focus of the product evaluation. It may be that the respondent responds to the question "How innovative is this product?" relying on an overall product assessment or it could be based on the technology involved in the product or the usage or benefits that the product offers. The confounding issue is that the researcher simply does not know what the respondent is considering when thinking about overall product innovativeness.

Researchers have also considered the innovativeness of the product's *technology* when measuring product innovativeness (see Table 2.1). Technological innovation occurs either as part of the manufacturing process (i.e., process technology) or as part of the product itself (i.e., product technology) (Tatikonda and Montoya-Weiss 2001). Innovativeness in process technology is important to product success as it provides firms with the capacity to create products more efficiently. Meanwhile, innovativeness in product technology can be implemented in new products to provide improvements in performance and increased benefits to consumers (Danneels and Kleinschmidt 2001; Shrivastava and Souder 1987). This, in turn, can provide a competitive advantage through product differentiation and increased product performance overall (e.g., sales, market share, profitability) (Gatignon and Xuereb 1997).

Technology is generally measured in conjunction with other indicators of product innovativeness (see Table 2.1). More specifically, technology is typically considered an indicator of innovativeness to the firm. It is frequently measured relative to the technology in other products offered by the firm (e.g., Danneels and Kleinschmidt 2000;

Firth and Narayanan 1996; Green, Gavin, and Aiman-Smith 1995; Meyer and Roberts 1986; Swink 2000; Tatikonda and Montoya-Weiss 2001). The degree of technical newness has also been measured relative to other products in the marketplace (e.g., Song and Parry 1999).

A review of Table 2.1 and the specific studies being cited suggests that many researchers believe technological newness to be a necessary component of product innovativeness. This is especially apparent in the research involving radical or discontinuous innovations. Some have argued that significant technological newness is a critical component of radical innovations (Anderson and Tushman 1990; Chandy and Tellis 1998; Gatignon and Xuereb 1997). The differentiation resulting from this discontinuous technology is seen as a potentially major advantage over competing products (Gatignon and Xuereb 1997). The necessity of technology, however, has been questioned both conceptually and empirically. Veryzer, Jr. (1998), for instance, contrasts the SONY Walkman with the switch from vacuum tubes to solid-state technology in televisions as an illustration. In the case of the Walkman, consumers generally saw it as a very new innovation even though the technology was not particularly advanced. The switch from vacuum tubes to solid-state technology in televisions, on the other hand, did involve a substantial shift in technology though consumers did not necessarily perceive it to be a radical innovation. This illustrates the point that technology may or may not always be necessary as a measurement of product innovativeness. It also suggests that the inclusion of technology seems to be situational rather than imperative part to overall product innovativeness. Finally, it emphasizes the need to understand product innovativeness as defined and perceived by the consumer. Because of a limited

comprehension of the technology involved in how a product works, consumers may not agree with assessments of product innovativeness provided by firms

Product features is the third representation of product innovativeness considered in the new product literature. In studying this dimension, questions are asked regarding the uniqueness of product features (Li and Calantone 1998; Yap and Souder 1994), the uniqueness of product benefits (Cooper et al. 1994), the presence of novel attributes (Mukherjee 1998), or the new usage possibilities (Hultink and Robben 1995). Conceptually, one sees that respondents would seemingly focus on what the product has (e.g., features and/or attributes) or on what the product does (e.g., benefits and/or usage possibilities) depending on the type of question being asked. This might in turn lead variance in responses as respondents consider either the nature of the product itself or what the product might do for consumers.

Who Determines How Innovative a Product Is

In addition to *what* is innovative about a new product, researchers generally direct respondents to make their innovative judgments relative to products, technology, or features of other products offered by the *firm* or in the *marketplace* (see Table 2.1). These two dimensions of newness – firm or marketplace – are generally attributed to the work of Booz-Allen and Hamilton (1982). This company's research suggests that new products can be assessed on a matrix constructed with the dimensions of *newness to the company* (old/new) and *newness to the marketplace* (old/new). This allows new products to be plotted according to their level of overall innovativeness. According to this typology, new products can be categorized as one of six types:

- *Cost reductions*: New products that offer similar performance at lower costs.
- *Repositioning*: Existing products that are targeted to new markets.
- *Improvements/Revisions to existing products*: New products with improved performance or value relative to existing products.
- *Additions to existing products*: New products that supplement established product lines.
- *New product lines*: New products that enter an established market.
- *New-to-World products*: New products that are new to both the firm and the market.

While the typology of Booz-Allen and Hamilton (1982) has been incorporated into several empirical studies on product innovativeness (see Table 2.1), a review of this literature points to two issues with its use. First, both dimensions have not always been measured together. Some studies have focused only on newness to the firm while others have emphasized newness to the market. Furthermore, a meta-analysis of empirical studies regarding the innovativeness-performance relationship suggests that the perspective taken in defining product innovativeness (new to the firm or new to the market) often moderates the relationship between product innovativeness and product performance (Szymanski, Kroff, and Troy, 2006). More specifically, whether a researcher rates innovativeness based on the perception of a firm versus that of a consumer impacts how product innovativeness influences new product performance. When a researcher considers innovativeness from the perspective of the consumer, the relationship is, on average, higher. This would imply that *both* newness-to-the-firm and newness-to-the-market should be captured as a measure of product innovativeness to obtain a more accurate measure based on this typology. Further consideration should also

be given to modeling these effects from the viewpoint of the firm (e.g., managers' evaluations) versus those held by the end user.

A second related issue is that each designated level of product innovativeness is not always well defined in those studies employing the Booz-Allen and Hamilton (1982) typology. In these cases, respondents may not be clear in their understanding of the distinction between the different levels. For instance, it would seemingly be difficult to distinguish between an *improvement to an existing product* and an *addition to an existing product* without a clear definition of each category. The resulting classification errors that might result could contribute to the variance in the overall research findings. An alternative to such categorization might be to rate product innovativeness on a continuous scale (see Table 2.1 for those studies employing this strategy). The latter does not require a subjective classification into one of a variety of categories but instead allows a continuous rating that might more accurately capture variance between respondents (Nunnally and Bernstein 1994).

Gaps in the Product Innovativeness Literature

With the above review of the product innovativeness construct as a backdrop, important gaps that exist in understanding product innovativeness and its relationship to attitudes and behavioral intentions over time can now be set forth. The importance of exploring these gaps seems timely as product innovativeness is receiving an increasing amount of attention in marketing journals (e.g., Ali, Krapfel, and LaBahn 1995; Atuahene-Gima 1995; Chandy and Tellis 1998; Gatignon and Xuereb 1997; Firth and Narayanan 1996; Griffin 1997; Hultink and Robben 1995; Kuester, Homburg, and Robertson 1999; Li and Calantone 1998; Madhavan and Grover 1998; Olson, Walker,

and Ruekert 1995; Sethi 2000; Shankar, Carpenter, and Krishnamurthi 1998; Song and Parry 1997; Swink 2000). As mentioned previously, however, reviews of the empirical literature have found an average relationship between product innovativeness and product performance that is positive but weak (Henard and Szymanski 2001; Szymanski, Kroff, and Troy 2006). These findings, contrasted with claims that product innovativeness is a key to new product success (e.g., Crawford 1977; Cooper 1993; 1996; Lynn, Monroe, and Paulson 1996; Sethi, Smith, and Park 2001) are indicative of the contrasting opinions regarding this relationship. Below are three gaps identified based on the review presented prior. Addressing these gaps may serve to better define and understand the nature of the relationship between product innovativeness and product performance.

- Gap 1: Product innovativeness has not been defined from the perspective of the consumer.
- Gap 2: Product form has not been studied separately as a dimension of product innovativeness.
- Gap 3: Thus, the impact of form innovativeness on attitudes and behavioral intentions has not been studied, especially its impact on attitudes and behavioral intentions over time.

These three gaps are discussed in detail below.

Gap 1: Innovativeness Defined from Perspective of Consumer

An important consideration in measuring product innovativeness is the perspective of the consumer (Cohen and Basu 1987; Danneels and Kleinschmidt 2001; Szymanski, Kroff, and Troy 2006). Measurements of newness to the market (versus newness to the firm) positively impact the relationship between product innovativeness

and performance (Szymanski, Kroff, and Troy 2006). Newness of the market refers to how innovative or new a product is to the consumers who will potentially use the product. While this has been a common measurement of innovativeness (see Table 2.1), it has been considered almost exclusively from the perspective of the firm (see Cox and Cox 2002; Mukherjee 1998 for exceptions). In other words, the consumers themselves have not been asked for their perceptions or ratings of product innovativeness. Rather, managers have given their *own* assessments of consumers' perceptions of the innovativeness of the firms' products. The underlying assumption is that firms understand their consumers well enough to make accurate assessments of consumers' views on product innovativeness. What is overlooked empirically, however, is that consumers may not notice the innovative changes in the product or its features or may not see the changes as being important (Robertson and Gatignon 1986). In other words, consumers' perceptions and ratings of product innovativeness may differ from those of managers due to a difference in perspectives regarding the complexity and usage of the products. In addition, they might also differ if management is not as closely connected with their consumers as they might think.

The importance of a consumer perspective of innovativeness is echoed by Bhoovaraghavan, Vasudevan, and Chandran (1996). They assert that it is the consumers themselves who ultimately decide how innovative a product is in the marketplace and this perspective should therefore be considered in modeling product innovation effects. Similarly, Gobeli and Brown (1987) argue that an industry measure of product innovativeness should include a dimension of newness (based on increased product benefits) as perceived by consumers. This dimension, in conjunction with a dimension

measuring newness to the firm, allows a more accurate categorization of overall product innovativeness. In other words, when firm and consumer perspectives are captured together, they can both be analyzed to assess their respective relationships with product performance.

While considering both firm and consumer perspectives is important in understanding the impact of overall product innovativeness on product performance, the interest here is in the perspective of the consumer. To reiterate, a substantial amount of research already exists at the firm level. Understanding product innovativeness at the consumer level will provide the second step in the quest to capturing the role of overall product innovativeness in product performance. Future research will hopefully be able to then compare and contrast both perspectives of product innovativeness and their respective relationships with product performance.

Gap 2: Product Form Considered as a Dimension of Product Innovativeness

While contemporary literature suggests that product form is increasingly being considered as an innovative strategy (Breen 2004; Hammonds 2002), this dimension of product innovativeness, however, has received little attention in the academic literature (see Cox and Cox 2002; and Muhkerjee and Hoyer 2001 for expections). Indeed, the overall impact of design, or product form, on consumers' evaluations of new products has received limited emphasis in the marketing literature. Bloch (1995) proposes that product form, defined as a product's exterior appearance, impacts psychological responses (i.e., cognitive and affective responses) to the product. Cognitive responses that may be affected include product-related beliefs and categorization. Affective responses may be either positive (i.e., liking) or negative (i.e., disliking). Psychological

responses, in turn, lead to consumer behavior responses (i.e., approach or avoidance) of the new product. In other words, the combination of beliefs, categorization, and liking/disliking of product form lead to an intention to either approach or avoid the product.

Form elements studied empirically in the literature include product and package color (e.g., Campbell and Goodstein 2001; Garber Jr., Hyatt, and Starr Jr. 2000), shape (e.g., Berkowitz 1987; Campbell and Goodstein 2001), sound and appearance (e.g., Veryzer, Jr. 1998), and unity and prototypicality (e.g., Veryzer Jr. and Hutchinson 1998). Specifically, congruency between coloring /labeling and product (e.g., orange color for orange juice) has been found to positively impact product evaluation (Garber Jr., Hyatt, and Starr Jr. 2000). Congruency of package shape (e.g., standard shaped wine bottle) also positively impacts product evaluation in situations of perceived high risk whereas moderately incongruent shape (e.g., triangular shaped wine bottle) positively influences product evaluation in situations of perceived low risk (Campbell and Goodstein 2001). Furthermore, products in their natural shape (i.e., untrimmed ears of corn) are preferred relative to altered products (i.e., trimmed ears of corn) (Berkowitz 1987). Finally, unity (i.e., the consistency in appearance) of product components positively impacts aesthetic response while prototype distortion (i.e., the inconsistency in appearance) negatively impacts aesthetic response (Veryzer, Jr. and Hutchinson 1998).

While the studies described above do deal with issues of variations in form and how they impact product evaluations and/or choice, there seems to be a lack of research that directly addresses innovativeness in form, characterized by uniqueness in the way the product looks *and* consumers' (un)familiarity with the unique look, and how this

innovativeness impacts overall product evaluations. Conceptually, Bloch (1995) has suggested that product form can impact liking (i.e., attitudes) and behavioral responses toward products. Furthermore and as addressed prior, both contemporary and academic literature has speculated the importance of innovative form as a strategy for new products (Crawford 1977; Cooper 1993, 1996; Hammonds 2002; Lynn, Monroe, and Poulson 1996; Sethi, Smith, and Park 2001). Therefore, this area of empirical research appears to be both relevant and lacking in the current marketing literature.

Gap 3: Impact of Form Innovativeness on Stability of Attitudes and Behavioral Intentions

As mentioned in the introduction, a change in reaction to new products or stimuli has been observed in both contemporary and empirical literature. For example, there are reports in the popular press of instances where, despite initial marketplace excitement, new products often fail (Appelbaum, et al. 1990; Power, et al. 1993). Also, there are documented instances of initially favorable product design assessments that do not lead to subsequent purchasing behavior (Lorenz 1986). Empirical research similarly reports the changing effects of visual novelty over time on a variety of individual responses including arousal, affect, and attractiveness (Berlyne 1960, 1970; Ortony, Clore, and Collins 1988; Zajonc 1968). Much of this work is found in research relating to mere exposure. Novelty is typically defined by the number of times the stimulus itself has been seen (e.g., Berlyne 1960, 1970) and/or by how similar or different the stimulus is relative to other previously encountered stimuli (e.g., Berlyne 1960; Conners 1964; Kagan 2002). In other words, the novelty of a stimulus decreases across multiple exposures to that stimulus.

Two important issues relating to the study of form innovativeness and repeated exposure are considered here. First, there is conflicting evidence regarding the direction of the relationship between novelty and liking across multiple exposures. Studies have reported a positive relationship (e.g., Cox and Cox 1988; Janiszewski 1988, 1993; Obermiller 1985), a negative relationship (e.g., Cantor 1968), and an inverted-U relationship (Ortony, Clore, and Collins 1988) between stimulus novelty and stimulus liking. Indeed, Ortony and his colleagues suggest that decreases in novelty can lead to changes in what they term as *momentary attitudes*. These attitudes (which are also known as attractiveness) are momentary in that they consist of the dispositional attitudes toward a stimulus, caused by past experience with and knowledge of the stimulus, and contextual effects, made up of the familiarity with the stimulus and other momentary effects such as mood and arousal. Accordingly, changes in momentary attitudes over time result from decreases in novelty and/or changes in arousal and/or mood.

Second, while the stimuli in the repeated exposure research have been novel, they have typically lacked meaning. Stimuli used in novelty research have included nonsense syllables (Zajonc 1968), geometric shapes (Cantor 1968), and drawings of fictitious animals made up from body parts of various animals (Berlyne 1970). While using stimuli without meaning in these cases essentially eliminated confounding effects of value judgments, the results may not generalize to other stimuli (e.g., products) that are meaningful to respondents. Indeed, research in marketing suggests that the meaningfulness, defined as the added value or relevance of an innovative product is critical to that product's success (Andrews and Smith 1996; Sethi, Smith, and Park 2001). Furthermore, research suggests that meaningfulness in differentiation is critical to the

profitability of mature products (Andrews and Smith 1996) and to the success of new products (Crawford 1977; Sethi, Smith, and Park 2001). The argument for relevance as an important dimension of product innovativeness stems from theoretical work on the social psychology of creativity (i.e., meaningful uniqueness) (Jackson and Messick 1964). According to this literature, without meaningfulness, novel objects are merely different or even "absurd." With meaningfulness in the innovativeness equation, there is no longer the necessity of a large degree of physical or technical difference between generations of products in creating innovative products. Consumers may perceive presumably mundane changes in a product as highly innovative if they produce meaningful differences in behavior or benefits (Andrews and Smith 1996).

As seen in Table 2.1b, a measurement of relevance has sometimes been included with a measurement of newness in defining product innovativeness in the empirical literature. A synthesis of the literature that considers the product innovativeness – performance relationship suggests empirically that there is a stronger correlation between an expanded measure of product innovativeness and product performance versus measures where meaningfulness is not included (Table 2.1a) (Szymanski, Kroff, and Troy 2006). This makes sense conceptually as respondents are "cued" to consider the advantages or benefits of the innovative product and rate product innovativeness accordingly when asked to consider the relevance or meaningfulness of the innovative product. When only newness is considered, however, there is not necessarily a positive valence attached to innovativeness. In other words, the relevance or meaningfulness of the innovative product does not interact with the newness resulting in a higher rating of overall product innovativeness. This research will explore, therefore, how form

innovativeness impacts attitudes and behavioral intentions toward meaningful stimuli (i.e., actual products) over time and whether the results are consistent with past repeated exposure findings. Specifically, it will seek to further understand how relevance impacts evaluations of innovative products by contrasting evaluations of products with innovative features that are relevant to product performance against products with innovative features that are not.

Summary

In summary, this dissertation seeks to address three critical gaps in the literature regarding product form as a means of product innovativeness. First, how do consumers define and perceive types of product innovativeness? Second, how does innovative product form influence attitudes and behavioral intentions toward new products? Third, how and when will these attitudes and behavioral intentions change over time? These questions will be addressed by considering form as either a relevant new product characteristic (i.e., important to the performance of the product) or one that is irrelevant (i.e., not important to the performance of the product), and how this relevance/irrelevance impacts the overall evaluation of new products over time.

CHAPTER III

CONCEPTUAL FRAMEWORK AND HYPOTHESES

A variety of issues remain unresolved relating to the relationship between product innovativeness and product performance. First, few studies have considered the product innovativeness – performance relationship from the perspective of the consumer. Second, while a synthesis of the product innovativeness – performance research suggests that a contingency perspective (e.g., how different product innovativeness types impact its relationship with product performance) might be more appropriate for understanding how product innovativeness impacts product performance (Szymanski, Kroff, and Troy 2006), there is limited empirical research taking this point of view. Finally, product innovativeness research has not considered extensively the empirical evidence in psychology documenting that the impact of stimulus novelty on stimulus liking can change over time.

In order to address these gaps, the research reported here will draw on principles found in the literature relating to attitude stability, unexpectedness and novelty. Drawing upon theories from these areas of research, a conceptual model and hypotheses will be postulated regarding the relationship between product innovativeness and product liking and how this relationship might change over time (i.e., the question of attitude stability). More pointedly, product *form* (i.e., the appearance of a product) will be considered as an innovative product feature and its relationship with liking and behavioral intentions toward products innovativeness in *function* (i.e., non-visual features) will be explored.

Theories in Attitude Stability Relevant to the Research

The stability of attitudes or liking has been considered from both cognitive and emotional perspectives. Research in attitude stability has traditionally considered attitude change based on conscious, informational-processing factors. Research in novelty/repeated exposure and attractiveness, on the other hand, typically considers liking from an emotional and /or non-conscious point of view. The theoretical work in each of these areas is considered next followed by the development of hypotheses relating to this research.

Attitude Stability

The theoretical explanation for unstable attitudes comes principally from extensive research involving the elaboration likelihood model (ELM) (Petty and Cacioppo 1981, 1984, 1986). According to ELM, attitude change or persuasion can occur through either a central or peripheral route. A central route is defined as the route involving issue-relevant processing. Alternatively, the peripheral route is defined by the processing of variables not relevant to a message or object. The use of the central route is based on the ability and motivation to engage in the evaluation of issue-relevant information. The likelihood that a central route will be taken increases as the motivation and/or the ability to process relevant information increase. The quality of arguments is most influential in the case of high ELM. In addition, relative to attitudes changed through the peripheral route, those changed through the central route are more resistant to change and counterpersuasion while also being more predictive of behavior (Petty and Cacioppo 1984).

The peripheral route to attitude change is based on cues that are not central to the attitude object. These include heuristics (Chaiken 1987; Petty and Cacioppo 1984), mere exposure effects (Bornstein 1989; Zajonc 1968), classical conditioning (Staats and Staats 1958; Cacioppo, Marshall-Goodell, Tassinary, and Petty 1992), misattribution of affect to the message (Petty and Cacioppo 1983; Schwartz and Clore 1983), and identification with the source of the message (Kelman 1958). The use of the peripheral route increases as the motivation and/or ability to assess central object attributes decreases (Petty and Cacioppo 1981, 1986).

According to the "tradeoff hypothesis" in ELM, the impact of either the central or peripheral route on attitude change or persuasion increases as the other decreases. Both can and often do occur at the same time but one is likely to be more impactful than the other depending on one's location on the ELM continuum (Petty, Kasmer, Haugtvedt, and Cacioppo 1987). In other words, the central or peripheral nature of the attribute is not a per se phenomenon. Movement in either direction on the continuum would change the impact of either route accordingly. Furthermore, according to the "multiple roles" hypothesis, any given variable can influence attitude change via a central or peripheral route (Petty and Cacioppo 1986). For instance, the beautiful scenery shown in an advertisement for a vacation spot could influence a viewer through a peripheral route if the viewer is not highly involved or paying close attention to the commercial. In this case the viewer might simply associate the beautiful scenery with the target location. On the other hand, a viewer who is highly involved with the vacation commercial might see the relevance and merit of the beautiful scenery as it relates to a potential vacation spot. In this case, the viewer is using the scenery as a part of central processing (Petty and

Wegener 1998). Therefore, variables may be used as part of either central or peripheral processing depending on where a person is on the likelihood continuum. For purposes of this research, involvement with the stimulus will be held constant to increase the likelihood that the measured variables (i.e., form and function innovativeness) will be considered either as a peripheral or central cue across all study respondents.

To summarize the relevance of ELM in explaining the impact of form innovativeness on attitudes toward new products, it is suggested here that innovativeness in form may serve to trigger an engagement in central processing because form attributes are perceptual and easier to process than verbal text (Edell and Staelin 1983). Furthermore, the novelty of the innovative feature causes an increase in attention (e.g., Berlyne 1960, 1970; Kagan 2002) and elaborate processing (Fiske 1982; Mandler 1982). What remains unknown is whether this attention and elaborate processing will hold over time, especially when the innovative form is not related to the performance of the product. If a person is evaluating a steam iron, for instance, will innovativeness in form cause that person to focus on the form of the iron or other relevant features (e.g., temperature settings, durability, etc.) across multiple exposures? If attention is initially drawn to features not relevant to product performance, attitudes influenced by these features may change over time. It could be, therefore, that innovative products that possess immediately noticeable innovativeness (i.e., innovativeness in form or visual design) result in initial reactions that indicate a high degree of liking or disliking of the product. This liking may change over time, however, as more central processing occurs - for example, if the innovative characteristics are not relevant or consistent with the nature or performance of the product. This issue will first be addressed in an exploratory study

described in a section following to further establish its face validity and then in the main study proposed subsequently to establish more fully its content validity in addition to its potential to explain changes in attitudes and behavioral intentions toward innovative products.

Attractiveness (Momentary Liking)

In addition to work in ELM, there is other preliminary evidence that the level of liking for products innovative in form may change over time. In a detailed description of emotional reactions to objects, Ortony, Clore, and Collins (1988) describe *attractiveness* as an emotion based on the momentary liking or disliking of an object. This momentary liking is a combination of the degree to which an object is appealing, the degree of familiarity one has with the object, and contextual factors such as mood and arousal. Appealingness is defined as the dispositional liking or disliking (i.e. attitude) toward an object, which is schema-driven based on past experience with the object or similar objects. If the object fits well with the schema, affect linked to that schema can be transferred to the object (Fiske 1982). Familiarity, as described by Ortony and his colleagues (1988), refers to the frequency of exposure to an object. Finally, contextual factors are those that may or may not be influenced by the object itself, such as mood or arousal, but might nevertheless impact overall object liking.

Based on the work of Ortony and his colleagues (1988), a judgment of liking of an object at a particular moment (i.e., an object's attractiveness) is a function of the object's appealingness (i.e., dispositional liking based on schema transfer), familiarity (i.e., lack of novelty), and contextual effects (e.g., mood or arousal). Product innovativeness, therefore, potentially impacts all three characteristics. Appealingness

could be impacted as more innovative objects, defined based on a lack of similarity with previously-encountered objects, rely less on schema transfer. Familiarity could be impacted as more innovative objects, defined by the number of exposures to the object, are liked more as they are encountered moderately more often. Finally, contextual effects could be impacted as the novelty of the innovative product stimulates arousal and/or affect.

Novelty

Novelty is typically defined by the number of times the stimulus itself has been seen (e.g., Berlyne 1960, 1970) and/or by how similar or different the stimulus is relative to other previously encountered stimuli (e.g., Berlyne 1960; Conners 1964; Kagan 2002). Accordingly, novelty measurement is dependent on how much the novel stimulus evokes responses attributable to generalization (Berlyne 1960). Thus, novelty would be highest when an object has not been seen before and when it is unlike other stimuli. Therefore, novelty (measured as unfamiliarity) decreases through repeated exposure and/or through exposure to similar stimuli.

As mentioned prior, evidence suggests that novelty impacts a variety of responses including attention (e.g., Berlyne 1960, 1970; Kagan 2002), arousal (Berlyne 1960, 1970; Meyers-Levy and Tybout 1989), affect (e.g., Gaver and Mandler 1987; Mandler 1982, 1995; McClelland et al. 1953), elaborate processing (Fiske 1982; Mandler 1982), and preference (e.g., Berlyne 1960, 1970, 1971; Cox and Cox 2002). The impact of stimulus novelty on attention is well documented (e.g., Berlyne 1960, 1970; Kagan 2002). Beginning with an orienting response, humans have been found to pay more attention to novel stimuli than to familiar stimuli. Furthermore, this relationship appears to be

curvilinear, with a moderate level of novelty having the greatest impact on sustained attention (Kagan 2002). Because this research involves only high and low product innovativeness, this curvilinear relationship will not be measured. It does suggest, however, that initial attention caused by extreme innovativeness in form may be brief but not sustained.

Evidence suggests that the impact of a stimulus on arousal is moderated by the novelty of the stimulus (Berlyne 1960, 1970; Meyers-Levy and Tybout 1989). For instance, Wilson and Wilson (1959) found that the impact of repetitive flashes of light on human arousal decreased over a period of thirty seconds. The impact rose again after a twenty-minute rest period, but not to the original value. Similar habituation results involving human subjects have been found with repetitive electric shocks (Seward and Seward 1934), arousing words (Woodworth 1938), and aversive air puffs to the cornea (Kagan 2002).

Affect, or emotion, has been described as the combination of physiological arousal with a valuative judgment (Mandler 1982). Accordingly, activity in the sympathetic nervous system (SNS) provides the strength of the affect while a cognitive evaluation of the meaning of the novel event provides the negative or positive "sign" of the emotion. There are mixed results regarding the impact of novelty (measured as discrepancies from adaptation level) on affect (measured as pleasure from results). These discrepancies are especially prevalent in the research stream regarding the repeated exposure – affect relationship.

A good deal of research has been conducted regarding the impact of repeated exposure on the evaluation of novel stimuli (e.g., Berlyne 1970, Cox and Cox 1988;

2002; Zajonc 1968) which has been summarized elsewhere (see Bornstein 1989 for a meta-analysis of the repeated exposure – affect relationship). Theoretical explanations for this relationship have been offered from both cognitive and non-cognitive perspectives. Cognitively, it has been argued that uncertainty reduction is responsible for the changes in liking across multiple exposures (Berlyne 1974, Sawyer 1981). This uncertainty reduction stems from learning that takes place regarding the stimulus. Response competition, optimal arousal, and two-factor theory are all cognitive explanations relating to uncertainty reduction that occurs through learning (Sawyer 1981). Response competition involves the uncertainty that occurs due to multiple responses that compete during initial exposure to a novel stimulus. This competition decreases over time as learning occurs, increasing liking. Optimal arousal argues that novel stimuli initially result in too much arousal. Over time, this arousal decreases to a more optimal level, which subsequently increases liking. Below this optimal point, arousal is minimized and liking decreases. Similar to optimal arousal, the two-factor theory suggests that tedium results from the initial difficulties in understanding or learning about a novel stimulus. This tedium decreases over time as the stimulus becomes more familiar and liking increases. Beyond a certain point, however, learning ceases and boredom sets in, resulting in a decrease in liking.

From a non-cognitive perspective, Zajonc (1980) argued that there is a separate affective response system that does not require joint cognitive processing to form emotional responses to novel stimuli. Accordingly, novel stimuli may be liked/disliked due to mere exposure alone, without cognitive processing relating to the stimulus. This

type of unconscious processing has also been supported by other research (e.g., Wilson 1979, Zajonc 1984).

Two important issues relating to the study of form innovativeness and repeated exposure are considered here. First, this research is not concerned with the unconscious effects of novelty on stimulus liking. There will be no attempt to distract participants or mask the relevance of the novel stimulus. It is of interest here instead to understand how the presence of a novelty in form impacts the overall evaluation of a product. Therefore, theoretical explanations relating to conscious processing (i.e., uncertainty reduction) will be invoked to postulate what should happen when participants have multiple opportunities to evaluate innovative products. Second, this research will include novelty in form that accompanies an evaluation that goes beyond form itself. Frequently, past research has considered novel stimuli that lack rationality or meaning. This research has included stimuli such as nonsense syllables (Zajonc 1968), geometric shapes (Cantor 1968), and drawings of fictitious animals made up from body parts of various animals (Berlyne 1970). While this has been necessary to control possible confounds and other factors that might impact the overall change in liking of the novel stimulus, it has made it difficult to generalize such findings to how consumers include an evaluation of novel form in overall product evaluations (Cox and Cox 2002).

Despite the problems with generalizing results from the repeated exposure literature, the one consistent finding across studies seems to be that liking/disliking frequently changes over multiple exposures to initially novel stimuli. This is especially important in the realm of innovativeness in product form as companies use visual concept testing as a way of gauging potential market acceptance of a new product design (Cox

and Cox 2002; Kotler and Rath 1984; Lorenz 1986; Page and Rosenbaum 1987). Furthermore, the limited conceptual and empirical research conducted in this area suggests that repeated exposure does indeed impact the liking of visual product designs (Cox and Cox 2002; Lorenz 1986). First, liking tends to increase according to uncertainty reduction (Berlyne 1974, Sawyer 1981). Second, mere exposure suggests that liking increases across multiple exposures for complex designs and decreases for simple designs through increased familiarity with the stimuli (Cox and Cox 2002).

Unexpectedness

The importance of considering expectedness as a factor that potentially impacts reactions lies in empirical work that has been done regarding *unexpectedness* and its influence on information processing and emotions. Evidence suggests, for instance, that unexpected events or stimuli cause "interrupts" in the decision-making process (Bettman 1979). These interrupts, in turn, attract attention to the unexpected stimuli. Furthermore, they may lead to changes in goal hierarchies, the addition of new goals, or the deleting of others. Therefore, the evaluation process itself may be altered based on the unexpectedness and/or novelty of a stimulus. These interrupts can only occur, however, if a threshold of unexpectedness and/or novelty is surpassed. Unexpectedness has also been described as an intensity variable that represents a backward-looking assessment of the normality of an event or stimulus and impacts emotions accordingly (Kahneman and Miller 1986; Ortony, Clore, and Collins 1988). Unexpectedness is "positively correlated with the intensity of the emotion" (Ortony, Clore, and Collins, 1988, p. 35). Accordingly, it increases positive evaluations of positive things and negative evaluations of negative things (e.g., Feather 1967; Spector 1956; Verinis, Brandsma, & Cofer 1978).

When there is an unexpected event that is positively or negatively valenced, the unexpectedness intensifies the negative or positive emotion (e.g., Feather 1967; Spector 1956; Vanhamme and Snelders 2001; Verinis, Brandsma, and Cofer 1978) resulting in pleasant or unpleasant *surprise*.

Based on the work described above, it is suggested here that unexpectedness could impact the initial positive or negative evaluation of an innovative product first by drawing cognitive attention to the unexpected innovativeness, and second by increasing the intensity of arousal triggered by the initial exposure to the product innovativeness (Charlesworth 1969; Vanhamme 2000; Vanhamme and Snelders 2001). Therefore, form innovativeness applied to product where function innovativeness is expected should result in a liking/disliking initially amplified by unexpectedness.

Summary of Theories Relating to Attitude Stability and Innovativeness in Form

With the literature on attitude stability as a backdrop, it seems reasonable to suppose that attitudes toward products that are innovative in form may change over time. First, ELM research suggests that attitudes are less stable when they are based on peripheral rather than central cues (Petty and Cacioppo 1984). In cases when form innovativeness is present but not relevant to a product's performance, for instance, initial attitudes may be high while subsequent attitudes may be lower as attention turns away from form attributes and all other product features are held constant. Second, in addition to dispositional attitudes, there are momentary attitudes, measured as overall attractiveness, which may be important to prediction of behavior and behavioral intentions (Ortony, Clore, and Collins 1988). These momentary attitudes may be strong (in either a positive or negative direction) at one moment due to the initial reaction to

novelty but may subside at a later time, giving way to more permanent attitudes. Third, research in unexpectedness and surprise suggests that unexpected occurrences amplify attitudes toward events or stimuli. Thusly, innovativeness in form has the potential to amplify initial responses (in either a positive or negative direction) to products that are traditionally considered to be function products. These responses should dissipate over time, however, as the unexpectedness wears off. Finally, a variety of research in visual novelty has found that an increase in familiarity (i.e., the inverse of novelty) typically has a positive effect on stimulus liking, unless the stimuli is simple in design, in which case the effect is typically negative (Berlyne 1960, 1970). With this theoretical background, the specific directions of this research can be addressed. This will be followed by the specific hypotheses to be tested and analyzed in Chapter IV. First, however, the need for and description of an exploratory study is described next.

Exploratory Study

The main premise behind this research is that innovativeness in form may have a changing impact on consumers' attitudes and behavioral intentions toward functionally innovative products. This premise is based on past theoretical and empirical work involving novelty (Berlyne 1970, 1974), ELM (Petty and Cacioppo 1981, 1984, 1986), momentary attitudes (Ortony, Clore, and Collins 1988), and unexpectedness (Kahneman and Miller 1986; Ortony, Clore, and Collins 1988). As mentioned prior, this cited work has typically been done with novel stimuli that either lacks meaning (e.g., novel shapes or designs), is hypothetical (e.g., written descriptions of products and their features), or consists of form products only. Therefore, an exploratory study was conducted here to make preliminary assessments of the likelihood that cognitive reactions to and attitudes

toward innovative products might change over time and that form innovativeness does impact the order in which product features are evaluated. As discussed prior, past research suggests that pictures are more attention-getting and easier to process relative to verbal or written text (e.g., Edell and Staelin 1983). Furthermore, there is theoretical support for the idea that novelty "interrupts" information processing (Bettman 1979) and changes, at least temporarily, the likelihood of central processing (Petty and Cacioppo 1986). Whether the dominance of pictures over verbal text and the interrupt of information processing remains over time, however, has not been well established. Therefore, demonstrating its actual occurrence in the context of evaluating innovative products would offer preliminary support and arguments for purported hypotheses in this area. In other words, if evaluation tendencies change in the presence of unexpected innovativeness in form, there would seem to be an increased chance that attitudes and behavioral intentions might also change. Furthermore, if this change in evaluation tendencies is only temporary, then so too might be the changes in attitudes and behavioral intentions. It is predicted here that the presence of form innovativeness should dominate early product evaluation and that this domination should decrease over time.

Exploratory Study Procedure

For this exploratory study, 12 undergraduate students were individually presented with written descriptions and pictures of products along with that were pretested to be innovative in either *form* (i.e., visual and hedonic features) or *function* (i.e., non-visual and utilitarian features). These products were also pretested to be traditionally considered as either form products (i.e., products that are judged primarily based on visual and hedonic features) or function products (i.e., products judged primarily based

on non-visual, utilitarian features). Finally, the included products were mismatched between their perceived innovativeness (form/function) and their perceived nature (form/function). In other words, a product that was considered to be a form product (a shirt) possessed a new feature that was considered to be innovative in function (built-in UV protection). Contrarily, a product that was considered to be a function product (a bathroom scale) possessed a new feature that was considered to be innovative in form (a round, transparent platform set on a modern-looking frame). The products were individually presented to study participants. Using a verbal protocol method (Lee and Olshavsky 1995), the researcher encouraged participants to "think out loud" as they evaluated each product. These verbal thoughts were recorded via a tape recorder for content analysis. Each participant returned the next day, not knowing the proposed task, and was asked to evaluate the same products a second time. Once again, each participant was asked to "think out loud" during his/her evaluation. At both time one and time two participants rated each product on overall liking.

Verbal protocol analysis is considered to be an effective means of understanding and evaluating patterns of thought processes (Simon 1992). Furthermore, it is principally a qualitative method of research, and as such, can be a method of deriving "theoretical structure that guides the analysis and interpretation of data (Deshpande 1983, p. 108)." With this in mind, evaluative responses to innovative products in this exploratory study were broken down into "episodes" or the smallest amounts of information that could be considered to have meaning. These episodes were then coded based on their perceived reference to either form or function product characteristics. The expectation was that there would be an initial emphasis on the innovative form features added to a function

product as these features would be visual and unexpected. For the form product, it was expected that the innovative function feature would not have an immediate impact but would, over time, become more important to the overall product evaluation.

Based on the evaluation of the verbal responses to these products, three important observations are discussed here. First, during the initial product evaluation of the function product that was innovative in form (i.e., bathroom scale), comments regarding form attributes were typically made prior to comments regarding function features whenever form innovativeness was present. For instance, the first comment one participant made was, "Looks very high-tech. I would like to have a scale like that in my bathroom." Initial comments such as this suggest that the visual and unexpected nature of the innovative form features were generally noticed first. This pattern also occurred for the form product with its innovative feature being in function (i.e., shirt). One participant first noted, "It's not very attractive. I don't know about the color selection..." This may be attributed to the initial dominance in visual features for a form product regardless of the presence or absence of innovative function features.

The second important observation from this study is that the dominance of observations regarding form decreased over time for both the form product and the function product. For instance, the participant noted above who evaluated the UV protected shirt first commented when seeing it for a second time, "The sun protection shirt, I think it's a great idea." In the case of the form product with function innovativeness, this may be attributed to a delayed reaction to the function innovativeness. In the case of the function product with form innovativeness, the initial attention given to the innovativeness in form appears to have decayed, leaving a second

assessment that involved more observations relating to function. The participant noted above who evaluated the bathroom scale first commented upon seeing it for a second time, “I think it's great that they can get within 1/10th of a pound.”

The final important observation from this exploratory study was that the overall liking of both products decreased between time one and time two. A single-item measure of liking was included in the survey completed at time one and time two. The average score of liking for the bathroom scale dropped by .78 while the average score of liking for the shirt decreased by .25 (both measured on a likert-type scale from 1 to 7).

Summary of Exploratory Study Findings

The results of the verbal protocol analysis conducted in the exploratory study offer preliminary support for the notion that there is some movement in the cognitive evaluation of new products that are innovative in either form or function. Furthermore, the average scores for liking decreased over time for both products. Therefore, it appears, at least in some settings, that incongruence between expected innovativeness type and actual innovativeness influences both the way information is processed and the subsequent stability in attitudes toward innovative products. While these findings are certainly somewhat speculative due to their exploratory and qualitative nature, they do nevertheless offer initial support to the suggestions postulated earlier that the nature of products and the nature of innovative features might interact to impact how consumers think about and evaluate innovative products.

With this exploratory study and the past theoretical and empirical work described earlier as a backdrop, an overview of and the methodological issues regarding the main study will be discussed next.

Research Directions

As stated prior, the primary purpose of this research is to explore the implications of using form as an innovative strategy. Furthermore, this research seeks to understand how and when attitudes and behavioral intentions toward products with innovative form might change over time. For purposes of this research, therefore, product innovativeness will be considered along dimensions of *form* (i.e., perceptible design elements that are readily noticed and more hedonic in nature) and *function* (i.e., elements that are less visibly noticeable and more utilitarian). Function innovativeness will be held constant here for two reasons. First, it seems reasonable to argue that most new products have at least some degree of newness in their function. Rarely does one see products that are innovative in form alone. Second, holding function innovativeness constant allows a focus on how the presence or absence of form innovativeness impacts liking of functionally innovative products when either form or function innovativeness is expected.

When products are considered on a form innovativeness dimension (high/low) and the nature of their expected innovative features are either in form or function, one begins to see how innovative form might impact the formation of and change in attitudes and behavioral intentions toward functionally innovative products. Product innovativeness that is unexpected based on the history of the product category (e.g., expected function innovativeness and high actual form innovativeness), for instance, might have initial influences on product liking that change over time. As an illustration, the iMac computer was hailed as an innovative success based primarily on a change in form (Mossberg 1999). The unexpected novelty in color and shape of the iMac (form innovativeness) led to a large jump in initial sales. Its real impact on the PC industry has

been challenged, however, primarily due to its lack of innovative features more relevant to the performance of a computer (function innovativeness) (Beale 1999; Mossberg 1999). By understanding how expected innovativeness type and actual innovativeness types interact, one can ascertain when form innovativeness might complement or detract from innovativeness in function. Stated formally, the primary objective of this research is to examine the joint effect of actual form innovativeness (high/low) and expected innovativeness type (form/function) on short-term and long-term liking and behavioral intentions toward functionally innovative products.

In summary, two important assumptions are made relating to what information is processed and how this processing impacts the liking of innovative products over time. First, based on the theory and exploratory research described prior, it is assumed that form characteristics are typically considered early, relative to function characteristics, when the product is a form product or when unexpected form innovativeness is present. Second, cognitive processing tends to shift to relevant product features (i.e., those relating to product performance) over time, regardless of those features being in form or function, leading to potential shifts in attitudes.

Variables of Interest

Prior to introducing the hypotheses to this research, it seems prudent to discuss the pertinent variables that will be considered throughout. A brief review of each of these variables and how each will be defined is presented next.

Product Innovativeness. A common thread running through all innovativeness definitions used in the new product literature is some form of "newness" (e.g., novelty, uniqueness, or differentiation) (Garcia and Calantone 2002). Indeed, the term innovate is

defined by Merriam-Webster (1998) as "to introduce as or as if new" (p. 603). Beyond simple newness, however, the product innovativeness construct becomes complex as it may be measured and evaluated on a variety of dimensions (e.g., technology, attributes, and/or design).

Product Innovativeness is typically considered as a product characteristic defined at the market level. As such, it is determined by its "newness to the world" (Booz-Allen and Hamilton 1982). It is not defined simply by its novelty (i.e., one's lack of exposure to a product) but also by its uniqueness to the market as a whole. The level of product innovativeness would decrease, therefore, only when something else displaces it or when it becomes the norm or new standard. Product innovativeness, as defined in this research, is determined by the uniqueness of a product and its novelty to the market.

Product Form. While others have considered product form characteristics to include both visual characteristics (i.e., scale, proportion, materials, color, reflectiveness, ornamentation, and texture) and non-visual characteristics (i.e., scale and tempo) (Bloch 1995; Davis 1987; Kellaris and Kent 1993), the focus here is on the visual elements. Issues relating to this type of product form that have been considered in the marketing literature include design prototypes and typicality and their relation to consumer evaluations (Veryzer and Hutchinson 1998), natural forms in food presentation (Berkowitz 1987) and the color of food (Garber, Burke, and Jones 2000) and their impact on perceived taste, the impact of packing coloring on preference (Garber, Hyatt and Starr 2000), and the impact of design complexity on the relationship between repeated exposure and product evaluations (Cox and Cox 2002).

The impact of product form on product evaluations is summarized conceptually by Bloch (1995). He suggests that product form directly impacts consumers' cognitive and affective responses, which in turn lead to behavioral responses. Cognitively, form impacts a variety of product-related beliefs, including durability, dollar value, technical sophistication, ease of use, sex role appropriateness, and prestige (Bitner 1992; Solomon 1983). In addition, novel or unusual products are harder to categorize and consumers prefer products that are moderately incongruent which results in further processing with some capacity to categorize (Meyers-Levy and Tybout 1989).

Affectively, product form impacts aesthetic response quoted by Bloch (1995) as a "deeply felt experience that is enjoyed purely for its own sake without regard for other more practical considerations" (Holbrook and Zirlin 1985, p. 21). These experiences are based on the intrinsic elements of the stimulus and encompass strong attention and involvement (Lewalski 1988; Veryzer 1993). Alternatively, product form may lead to negative affective responses.

Finally, behavioral responses to product form may be related to either approach or avoidance. Approach activities include extended viewing, listening, touching, or ultimately purchasing the product while avoidance activities include resistance to view or purchase the product (Bloch 1995).

Form Innovativeness. It is rare in the research involving product form to find research that considers form innovativeness and its relation to product liking (see Cox & Cox 2002 and Veryzer & Hutchinson 1998 for exceptions). Recall that innovativeness, as defined in this research, consists of the degree that a new product is unique or new-to-the-world (Booz-Allen & Hamilton 1982). In other words, it relates to how different one

product is relative to another product. *Form innovativeness*, therefore, is defined as the degree of novelty or uniqueness in a product feature relating to the product's utilitarian performance. One purpose of this research is to explore the relationship between a high degree of form innovativeness and product liking. In addition, this research seeks to understand how this relationship might change over time.

Expected Innovativeness. An assumption made for this research is that there are expectations regarding future new features for various product categories. These expectations result from the nature of the product category and what features are considered to be most important in that category. For instance, one could reasonably expect that new features for vacuums will most likely be related to improving their performance. Conversely, new features for picture frames will most likely be related to design or form.

Attitude. Simply put, attitudes represent "people's evaluations of objects" (Chaiken, Pomerantz, and Giner-Sorolla 1993, p. 387). More formally, an attitude has been defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly and Chaiken 1998, p. 269). Attitudes develop as affective, cognitive, and behavior responses to attitude objects (Eagly and Chaiken 1993) and represent one or a mixture of more than one of these evaluative responses. These responses are expressed as approach or avoidance, like or dislike, and approval or disapproval (Eagly and Chaiken 1998).

Behavioral Intention. Behavioral intentions have been defined as "instructions people give to themselves to behave in certain ways" (Triandis 1980, p. 203 in Belk 1985). Behavioral intentions therefore, should be the best predictors of how consumers

behave as they represent views from consumers themselves (Ajzen & Fishbein 1980; Belk 1985). In addition to being measured as predictors of behavior, behavioral intentions have also frequently been used as surrogates for behavior (Belk 1985; Miniard and Cohen 1979).

The interest in capturing both attitudes and behavioral intentions in this research is to begin to understand how each changes in reaction to innovative new products. It is expected that differences will appear between attitudes and behavioral intentions as behavioral intentions are traditionally considered to be closer to and more predictive of actual behavior (Ajzen 1991, 1996; Ajzen & Fishbein 1980). It may be, therefore, that more in-depth thinking occurs when considering behavioral intentions relative to attitudes. Changes in behavioral intentions may not be as strong as those in attitudes, therefore, but should generally change in the same direction when they do change.

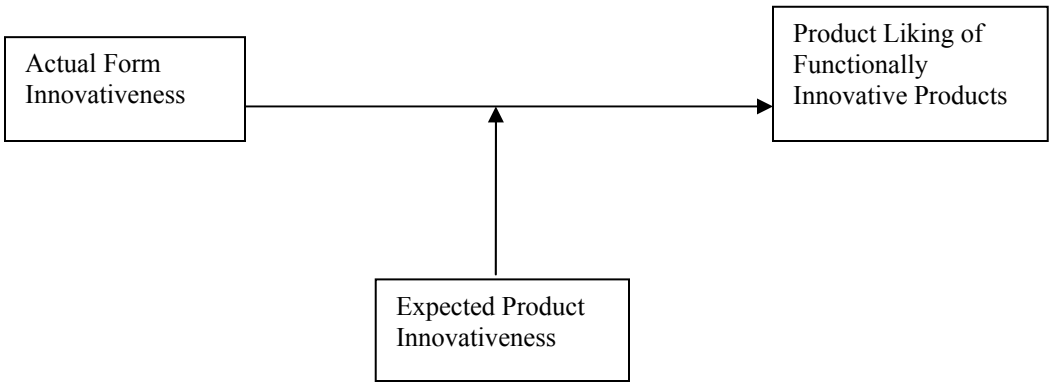
The relationship between the variables described above is illustrated conceptually in Figure 3.1. This is followed by a detailed description of the proposed hypotheses to be empirically tested discussed in Chapter IV.

Hypotheses Generation

The overarching theme of this research is that the unexpectedness of innovative product attributes, combined with the actual innovative attribute type, may lead to instability in liking and behavioral intentions over time. That is, at time one (t_1), the expectation is that attitudes may be influenced by surprising innovativeness while at time two (t_2), attitudes should be more heavily influenced by those features more germane to the product type. In other words, when expectations regarding a product and its attributes are disconfirmed, the overall evaluation may be influenced heavily by the innovative

FIGURE 3.1

The Joint Impact of Form Innovativeness and Unexpected Innovativeness on Liking of Functionally Innovative Products over Time



attributes and their perceived importance. Furthermore, this initial evaluation may be only temporary as the novelty and/or relevance of the new attributes wears off prior to or during subsequent evaluations. This dissertation considers specifically cases in which innovativeness in form (i.e., innovativeness that is visible and easily perceived) is applied in a functionally innovative context (i.e., when innovativeness is not visible but relates to the performance of a product). These situations are then contrasted with those cases involving low form innovativeness applied to the same context.

It should be noted here that a given attribute may be innovative in both form and function. A flat-screen computer monitor, for instance, is a product that is innovative in both how it looks and how it performs. In other words, the monitor is both visually different and it functions differently as it takes up less space. Additionally, a product may have attributes that are innovative in form and other attributes that are innovative in function. This research is concerned with those cases in which given new attributes are

innovative primarily in either form or function, but not in both. This allows a more isolated analysis of the impact of each on overall product evaluations.

As a review, the principal variables of interest and their respective definitions are as follows:

- *Function innovativeness*: the degree of novelty or uniqueness in a product feature relating to the product's utilitarian performance.
- *Form innovativeness:* the degree of novelty or uniqueness in a product feature that is visual and not related to the product's utilitarian performance.
- *Expected innovativeness:* the type of innovativeness anticipated for a particular product based on its principal function (form vs. function).
- *Attitude:* the degree of overall liking of a product.
- *Behavioral intention:* The likelihood that a product would be purchased.

Summary of Theory Used in Hypotheses Generation

In preparation for discussion of hypotheses generation, a review of the theory that will be applied is offered here. There are four areas that were covered prior that are used to hypothesize how form innovativeness and expected innovativeness might impact attitudes and behavioral intentions toward functionally innovative products- elaboration likelihood model (ELM), mere exposure, momentary attitudes, and unexpectedness. A brief review of each of these areas is presented along with a summary of how each is expected to influence the impact of form innovativeness on attitudes toward functionally innovative products.

ELM. Two important points were discussed as they relate to ELM and form innovativeness. First, work in ELM suggests that attitudes based on peripheral cues are

not as stable as those relating to central cues (Petty and Cacioppo 1984). Second, stimulus novelty has been shown to increase attention (Berlyne 1970; Kagan 2002) and elaborate processing (Fiske 1982; Mandler 1982). These two points are important when considering form innovativeness as it sometimes serves as a peripheral cue (when applied to a function product). Furthermore, by definition, form innovativeness is novel and therefore should demand attention initially. In sum, form innovativeness may initially be important to attitude formation as it demands attention but may not remain important as it is only a peripheral cue and not central to the overall assessment of a function product. This summation was supported preliminarily by the exploratory research described prior in which form features were generally described prior to function features when the product was form and/or when there was unexpected form innovativeness involved.

Thus, past work in ELM suggests that innovativeness in form should lead to an initial focus on form followed by an increased focus on the relevant function features when it is a function product. Alternatively, innovativeness in form might divert attention from innovative function features when the product is a form product.

Novelty/Mere Exposure. As discussed prior, past research suggests that overall liking or preference does change across multiple exposures to novel stimuli. First, liking tends to increase according to uncertainty reduction (Berlyne 1974, Sawyer 1981). Second, mere exposure suggests that liking increases across multiple exposures for complex designs and decreases for simple designs through increased familiarity with the stimuli (Cox and Cox 2002). Therefore, dual forces may be expected when form innovativeness and/or function innovativeness are encountered when the innovativeness is considered to be simple rather than complex. A positive increase may occur over time

as the respondent becomes more certain about the novel stimulus while a negative force might also occur if the novelty is considered to be simple rather than complex.

To summarize how novelty and mere exposure might impact the form innovativeness – attitude relationship, attitudes toward products will likely decrease (for simple designs) over time according to mere exposure. As will be detailed later, study respondents in this research will only see the visual representation of the product at time one, however, potentially resulting in a minimized effect of mere exposure. In this case, the attitude may remain high. Also, only two evaluations may not be enough to cause a strong effect through mere exposure. More likely, novelty should trigger more in-depth processing, causing an analysis of both function and form issues, resulting in an attitude that is stable over time when the innovative feature matches the product type.

Momentary Attitudes. Theoretical work in this area suggests that overall liking of a stimulus at a particular time (i.e., attractiveness) consists of both a dispositional attitude and emotional factors that are situational (Ortony, Clore, and Collins 1988). These factors include arousal and the familiarity of the stimulus. This work is applicable here as form innovativeness would initially be considered novel (the inverse of familiar) and surprising (which should increase arousal) when it is unexpected. Both the novelty and unexpectedness should decrease over time resulting in an attitude based more on dispositional feelings toward the stimulus.

According to work in momentary attitudes, therefore, one could argue that innovativeness in form applied to a function product may cause an initially strong reaction that subsides over time, leaving an attitude based more on the relevant features of the product.

Unexpectedness. As mentioned prior, the unexpectedness of events acts as an amplifier to the emotional reaction to that event (Ortony, Clore, and Collins 1988). Therefore, positive events that are unexpected are considered to be more positive and negative events that are unexpected are considered to be more negative (e.g., Feather 1967; Spector 1956; Vanhamme and Snelders 2001). In the case of form innovativeness (or function innovativeness), the degree to which its occurrence is unexpected should therefore increase the initial emotional response to it. Over time, this emotional response should decrease.

To summarize how unexpectedness applies to this research, unexpectedness of form innovativeness should lead to an amplified effect in initial attitudes toward function products. This amplification should amplify both positive and negative initial attitudes, though it is anticipated that the initial evaluation of innovativeness in form will be positive, resulting in an amplified positive reaction when involving a function product. Over time, this effect should erode as unexpectedness decreases, resulting in an attitude that becomes less positive or negative at time two.

Hypotheses

In Study 1, the primary purpose is to analyze the changing impact of form innovativeness on attitudes and behavioral intentions toward functionally innovative products. It will *not*, however, involve repeated visual exposure to the innovative product. Instead, study participants will see the products only one time. Subsequent evaluations will be based solely on memory of the products and their attributes. This will be done for multiple reasons. First, by manipulating the presence of the innovative product, one can better its impact on attribute changes in attitudes and behavioral

attitudes. In other words, the initial attention and arousal generally attributed to visual novelty may not be present at time two due to both the time between evaluations and the absence of the product at time two. Changes in attitudes and behavioral intentions, therefore, should be attributable, at least in part, to the change in attention and arousal that occurs between time one and time two.

The central research questions addressed in this research will be considered in two contexts: products with *expected form innovativeness* and products with *expected function innovativeness*. Considering these two contexts allows an analysis of not only the impact of form innovativeness on the overall assessment of functionally innovative products, but also the inclusion of innovativeness expectedness and how this interacts with form innovativeness in the overall product assessment. In other words, when unexpected innovativeness is applied to a new product (e.g., form innovativeness applied to a function product), one might expect a degree of surprise that amplifies the initial reaction to the product and subsequently decreases over time. Therefore, the hypotheses described below are divided based on the contexts of *expected function innovativeness* and *expected form innovativeness*.

Context One: Functionally Innovative Products Where Function Innovativeness Is Expected. Products in this scenario (e.g., steam iron, hand vacuum) possess a functionally innovative feature and are typically judged based on function features. Therefore, there is a match between the innovativeness type that has occurred and that which was expected. It is within this context that the changing impact of form innovativeness over time will be assessed (see Figure 3.2).

FIGURE 3.2

A Matrix Illustrating the Combinations of Form Innovativeness and Time for Functionally Innovative Products Where Function Innovativeness Is Expected

		Form Innovativeness
	High	**Low**
Time One	Cell 1	Cell 3
Time Two	Cell 2	Cell 4

In comparing Cell 1 with Cell 2, recall that there is expected and actual innovativeness in function. In addition, there is actual innovativeness in form (e.g., a steam iron with a unique water pre-heating feature *and* an innovative visual design). In that the innovativeness in form is visual, it should draw initial attention at time one. Furthermore, unexpectedness should also be a factor as the product is one principally evaluated based on function. Finally, ELM suggests that the innovativeness in form should also result in an attitude based on peripheral processing as form is not central to the product's performance. However, ELM also suggests that novelty results in an increase in attention and central processing (Petty and Cacioppo 1981, 1984, 1986). This central processing should involve the innovativeness in function as it is more relevant to the overall evaluation of a function product. As suggested by the exploratory research described earlier, the innovativeness in form appears to dominate processing at time one while innovativeness in function takes over at time two. This leads one to argue that there is a switch from peripheral to central processing over time in this scenario, resulting in a change in attitude between time one and time two.

In sum, the stability of liking over time should be impacted by two factors. First, familiarity with the innovative form should increase, resulting in a decrease in liking (Berlyne 1960, 1970). Second, unexpectedness should decrease, resulting in an attitude at time two that is based primarily on an assessment of the innovative function. Whether or not attitudes change between time one and time two should depend, therefore, on how the innovative function is assessed, minus the initial effect of the unexpected innovativeness in form. Therefore, it is hypothesized here that overall attitude will decrease between time one (Cell 1) and time two (Cell 2).

H1: For a function product that is high in both form and function innovativeness, attitudes will decrease between time one (Cell 1) and time two (Cell 2).

In comparing Cell 3 with Cell 4, the innovative function in this scenario is not accompanied by innovativeness in form. Instead, the product is prototypical for its category in its appearance. It is anticipated, therefore, that there will be little effect caused by unexpectedness. Cognitive processing should be central and related principally to the innovative function and its relevance to overall product performance. This should be the case at both time one and time two. Therefore, little change in attitude should occur. In sum, the evaluation in both Cell 3 and Cell 4 should be based solely on the assessment of function innovativeness as there is no form innovativeness to consider and this assessment should be stable over time.

H2: For a function product that is innovative in function but not in form, attitudes will change less between time one (Cell 3) and time two (Cell 4) relative to when innovativeness is in both form and function (Cells 1 and 2).

Context Two: Functionally Innovative Products Where Form Innovativeness Is Expected. Products in this scenario possess an innovative feature that is related to

function but are typically judged based on features related to visual design or form (e.g., picture frame that holds digital photos). Therefore, there is a mismatch between the innovativeness type that has occurred (function) and that which was expected (form). It is within this context that the changing impact of form innovativeness over time will be assessed (see Figure 3.2).

FIGURE 3.3

A Matrix Illustrating the Combinations of Form Innovativeness and Time for Functionally Innovative Products Where Form Innovativeness Is Expected

	Form Innovativeness	
	High	**Low**
Time One	Cell 5	Cell 7
Time Two	Cell 6	Cell 8

In considering Cells 5 and 6, form innovativeness should have an immediate effect on attention and attitude at time one, as it is visual. The innovativeness in form is not high in unexpectedness, however, as it is applied to a form product. According to ELM, attention and attitude assessment should be focused on the central product cues (Petty and Cacioppo 1981, 1984, 1986). In this case, these central cues would be the visual characteristics as this is a form product. The presence of form innovativeness, therefore, should be analyzed as an important product characteristic during both the initial and subsequent evaluations. Theory in novelty suggests that increased familiarity with the new form should cause a decrease in liking (Berlyne 1970, Cox and Cox 2002). As suggested by ELM, because function features are not considered to be as relevant for

form products, and because innovativeness in form draws attention to issues relating to form, it is expected that the function innovativeness will not play a significant role in influencing attitudes and behavioral intentions initially. Over time, however, it should play an increased role as its relevance as a central performance issue increases, as suggested by the exploratory research described prior. Whether this results in a change in attitude, however, depends on how important the functionally innovative feature is to the overall product performance and how well it is expected to perform. Because this is a form product, it is anticipated that the decrease in liking due to familiarity will be stronger than the increase in attitude caused by the evaluation of the innovative function

H3: For a form product that is innovative in form and function, attitudes Will decrease between time one (Cell 5) and time two (Cell 6).

In Cells 7 and 8, there is functional innovativeness that is not accompanied by form innovativeness. Furthermore, the expectation is that any innovativeness would be in form, making the presence of function innovativeness unexpected but unnoticed versus unexpected and readily visible or noticeable. Because the innovativeness is not visual, however, there should be an initial limited impact on attention and cognitive processing. Attitude assessments at this point should be based primarily on an evaluation of the innovative function feature as there is nothing new about the way the product looks. Furthermore, this initial attitude assessment may be amplified by the limited degree of unexpectedness that occurred. During the subsequent evaluation, unexpectedness should not be a factor. Attitudes at this point should again be based primarily on an assessment of the innovative function feature and its reference to the performance of the product. While it may vary from the initial attitude due to the lack of unexpectedness, the change

should be less than in the case of expected form innovativeness accompanied by actual form innovativeness.

H4: For a form product that is innovative in function but not in form, attitudes will change less between time one (Cell 7) and time two (Cell 8) relative to when innovativeness is in both form and function (Cells 5 and 6).

As mentioned prior, theories relating to the attitude – behavior relationship suggest that behavioral intentions are considered to be closer to and typically more predictive of actual behavior than are attitudes (Ajzen 1991, 1996; Ajzen & Fishbein 1980). In addition, a variety of factors influence behavioral intentions beyond attitudes, such as subjective norm and perceived control (Ajzen 1991, 1996; Ajzen & Fishbein 1980). Behavioral intentions are measured in this research to gauge their consistency with hypothesized product innovativeness – attitude relationships. Because they will be captured in conjunction with attitudes and assuming subjective norms and perceived control can be controlled, it is predicted that behavioral intentions should mirror attitudes in each of the four cases described prior. While the focus of this research is primarily on attitudes as the dependent variable, it should provide beneficial to future research to assess what also happens with behavioral intentions.

CHAPTER IV

METHODOLOGY

The purpose of this chapter is to describe the overall methodology employed in testing the hypotheses developed in Chapter III. First, an overview of Study 1 will be offered. This will be followed by an overview of Study 2. Next, details regarding the development of the independent and dependent variables and their measures will be set forth. Finally, the procedure and methods for testing the hypotheses will be described.

Overview of Study 1

The purpose of Study 1 is to test the hypotheses (i.e., H_1– H_5) regarding the impact of form innovativeness and expected innovativeness on the evaluation of functionally innovative products over time. Participants are shown color, computer-generated pictures of two new products and a short list of relevant features and are then asked to answer a questionnaire regarding their attitudes and behavioral intentions toward these products. After completing a short task to clear short-term memory, participants are prompted to complete the questionnaire a second time without seeing the product pictures. The pictures and feature listings are designed to manipulate the expectedness of the innovativeness (Form/Function) the degree of actual form innovativeness (High/Low), and the number of exposures (t_1 / t_2) in a 2 x 2 x 2 experimental design. Multiple products (e.g., picture frames and desk lamps) are used in each of the four resulting expected/actual innovativeness categories in order to increase construct validity of the manipulation of expected and actual innovativeness. Measuring expected/actual innovativeness across multiple products allows a broader check of each construct's validity through a factor analysis of each construct's items (Cook and Campbell 1979).

Overview of Study 2

The major difference between Study 1 and Study 2 is how the stimuli are presented at t_2. As mentioned above, Study 1 participants do not see a visual representation of the stimuli at t_2. Participants in Study 2, on the other hand, do see a visual representation of the stimuli at t_2. With this one exception, all other procedures relating to the experiment are identical to Study 1.

The justification for Study 2 lies in the important differences that might occur when respondents see innovative looking stimuli multiple times as opposed to only seeing them once. First, multiple exposures to novel stimuli should invoke issues relating to mere exposure and arousal and how they continually impact product evaluations over time. Single exposures to novel stimuli followed by subsequent evaluations without seeing the novel stimuli, on the other hand, should involve issues relating to attention and arousal initially but not necessarily during subsequent evaluations. Instead, cognitive resources should be devoted to what is remembered regarding the stimuli. Second, the presence of the stimuli at t_1 and t_2 might result in continued interference effects resulting from visual dominance that prevents a focus on the more important stimuli features that are related to performance. Contrasting the results of Study 1 and Study 2, therefore, should offer further evidence of how form innovativeness impacts evaluations of functionally innovative products when the innovative product is present versus absent over time.

Because studies 1 and 2 are identical with the exception of the presence/absence of the stimuli at t_2, the methodology described below pertains to both studies.

Independent Variables

Four product descriptions are presented in order to manipulate the independent variables of actual form innovativeness (High/Low) and "expected type" of innovativeness (i.e., where innovation has generally been focused and what consumers thus expect in a particular product category) (Form/Function). Each product description contains three sentences, with each sentence describing a feature of the new product. This is consistent with past research that suggests that more than 90 percent of ads in the United States contain descriptions with 0 to 4 items of factual information (Stern, Krugman and Resnick 1981). The first sentence of each description begins with the word "new," the name of the product, and a description of the product's innovative function (e.g., "new picture frame with LCD screen for digital pictures"). The new feature is always listed first to increase the chance that priming will occur, allowing the feature to be both noticed and available for future processing (Meyers-Levy and Tybout 1989; Sujan 1985) and to hold order effects constant. The final two sentences describe two features commonly found in print advertisements for each respective product. The eight picture/feature combinations are shown in Appendix 1. The methods for finding appropriate products to be used in this study are described next.

Form/Function Expectedness. It was critical for this study to identify product categories in which there is an inherent expectation of either innovation of form or function based on the history of that category. The first step in this I.D. process was to develop scales for determining form and function innovativeness expectedness across product categories. The process of scale development followed the procedure set forth by Churchill (1979). First, a pool of questions seemingly related to the constructs of form

and function innovation expectedness was generated by the researcher. These questions were then shown to faculty and doctoral students, along with the developed definition of form and function innovation expectedness, to determine the questions' face or content validity. After modifying suggested questions, the finished questionnaire was pretested amongst 53 undergraduate students and across a variety of product categories. Table 4.1 illustrates those questions included in the pretest. The questions' ability to reliably measure expected form innovativeness and expected function innovativeness was then assessed by calculating Chronbach's alpha for each group of questions (i.e., those measuring form innovativeness and those measuring function innovativeness). Finally, factor analysis was applied to ensure that the appropriate questions loaded on expected form innovativeness and expected function innovativeness constructs respectively.

TABLE 4.1

Questions Pretested for Measurement of Product Innovation Expectedness

	Strongly Disagree						**Strongly Agree**
New features in the **steam iron** category are commonly related to the product's appearance†	1	2	3	4	5	6	7
A person would typically expect new **steam iron** features to be related to product performance‡	1	2	3	4	5	6	7
New features of a **steam iron** generally add new functions or improve existing ones‡	1	2	3	4	5	6	7
When evaluating a new **steam iron**, a person would typically expect newness in the way the product looks†	1	2	3	4	5	6	7
People typically expect a new **steam iron** to do something new or to do something better‡	1	2	3	4	5	6	7
A person would typically expect new **steam iron** features to be related to visual design†	1	2	3	4	5	6	7

Note: The † symbol denotes those questions measuring form innovation expectedness. The ‡ symbol denotes those questions measuring function innovation expectedness.

Because a critical variable in this study is "actual innovativeness type" (i.e., the innovation that actually occurred as opposed to what was expected), a search for relevant product categories was done using catalogues from retailers commonly offering innovative products – Sharper Image and Brookstone. From these magazines, 26 product categories were first selected by the researcher based on their perceived likelihood for being considered as either those with expected form or function innovativeness. Using the scales developed prior for both expected form and function innovativeness, 25 respondents rated each of the 26 product categories. The average score on form innovativeness was then subtracted from the average score on function innovativeness, resulting in either a negative or positive difference score. Accordingly, the maximum difference score could be -6 or 6. This was done in an attempt to find those product categories at the polar ends of the product innovativeness spectrum (i.e., form at one end and function at the other) and to avoid those categories in the middle where both form and function are expected.

Table 4.2 includes those product categories that had difference scores greater than 1 or less than -1. The four product category scores with the largest negative difference scores were retained for consideration as being high in expected form innovativeness and low in expected function innovativeness. These product categories included picture frames, sunglasses, dog dishes, and desk lamps. The four product category scores with the largest positive difference scores were retained for consideration as being high in expected function innovativeness and low in expected form innovativeness. These product categories included leaf blowers, tire gauges, steam irons, and hand vacuums.

Using these products, the next step was to determine which products rated highly in actual from/function innovativeness.

TABLE 4.2

Difference Scores for Product Categories with Expected Innovativeness Scores Greater Than 1 and Less Than –1

Product	Expected Form Innovativeness	Expected Function Innovativeness	Difference[a]
Picture Frame	**5.91**	**2.86**	**-3.05***
Sunglasses	6.01	3.43	-2.59*
Dog Dish	4.85	3.05	-1.80*
Desk Lamp	**5.57**	**3.84**	**-1.73***
Shoes	6.23	4.52	-1.71*
Wrist Watch	5.39	4.31	-1.08*
Leaf Blower	3.58	5.73	2.14*
Tire Gauge	2.76	4.49	1.73*
Steam Iron	**4.11**	**5.71**	**1.61***
Hand Vac	**4.56**	**6.14**	**1.58***
Fingernail Clippers	3.06	4.31	1.25*
Digital Camera	5.41	6.61	1.20*
Home Theatre System	4.84	5.97	1.13*
Camcorder	5.30	6.42	1.12*

Note: Those products in bold were retained for use in main study.
[a]Equal to Expected Function Innovativeness minus Expected Form Innovativeness.
*$p<.01$ in paired-samples t-test.

Prior to finding products in these categories that were high/low in *actual* form innovativeness and which also possessed *actual* innovative function attributes, the product categories being considered were narrowed from four product categories in each innovativeness category to two. This was done for two major reasons. First, the inherent differences between product categories might cause variance in results, thus preventing the isolation of effects caused by the manipulation of the variables of interest. By using

fewer product categories, therefore, more focus could be placed on limiting the differences between them, allowing for potentially more homogeneous results. Second, fewer product categories allows a sufficient degree of statistical power based on a 2 x 2 x 2 experimental design and a limited number of study participants (Cohen and Cohen 1988).

It was determined to move forward using picture frames and desk lamps as the product categories high in expected form innovativeness and low in expected function innovativeness, while using hand vacuums and steam irons as the product categories high in expected function innovativeness and low in expected form innovativeness. These particular products were selected for two reasons. First, they seem to represent those most commonly used by the expected pool of study participants (i.e., undergraduate college students). It seems reasonable that college students would be more familiar with and use more frequently items such as a desk lamp and a steam iron than others such as a camcorder or a leaf blower. Second, usage of the products chosen is more likely to be in private and should therefore, be influenced less by issues related to public consumption. Products such as sunglasses and wrist watches would generally represent public products, meaning they are used in the presence of others. Past research suggests that public products have symbolic meaning (Gardner and Levy 1955; Levy 1959). As such, the purchase of these types of products is influenced by issues relating to image congruence such as self-monitoring (Graeff 1996). To avoid confounding effects relating to the evaluation of public products, the products chosen for this study are seemingly more private.

High/Low Form Innovativeness. Actual form innovativeness was manipulated by the presence or absence of innovativeness in the visual design of the products. The products were pretested to be either visually unique (High Form Innovativeness) or visually prototypical (Low Form Innovativeness) relative to other products in its respective category. This pretesting was done by showing four different visual representations of products in each of the four product categories to 30 respondents who rated them on 7-point scales of "how innovative or unique looking" each product was. The most innovative and least innovative looking products for each category were then used as stimuli for the main study. The ratings for the most and least innovative looking products in each category are shown in Table 4.3. A paired-samples t-test indicates that the difference between the most innovative looking and least innovative products for each product category is statistically significant.

TABLE 4.3

Ratings for Most and Least Innovative Looking Products in Each Category

Product	Least Innovative Looking Product	Most Innovative Looking Product	Difference[a]
Picture Frame	3.00	6.20	3.20*
Desk Lamp	3.31	5.90	2.59*
Hand Vacuum	3.23	5.90	2.67*
Steam Iron	3.03	5.47	2.44*

Note: Ratings are based on 7-point scale anchored by "Not at All Innovative Looking/Very Innovative Looking."
[a]Equal to Expected Function Innovativeness minus Expected Form Innovativeness.
* $p<.01$ in paired-samples t-test.

Function Innovativeness. Because function innovativeness was to be held constant across product categories in both studies, it was necessary to identify a function feature in each of the four product categories (i.e., picture frames, desk lamps, hand vacuums, and

steam irons) that was new to potential study participants. Thus, various sources (i.e., manufacturer websites, retail catalogues, and retail websites/stores) were searched for potentially innovative features and commonly advertised features in the four products mentioned prior. In addition, surveys were conducted in search of category features common to students. Based on the information gathered, one feature was deemed to be potentially innovative to future study participants and two others were selected as common features (see Figure 4.1). Thirty students were then surveyed and asked the question, "What are the 3 or 4 product attributes or features that are most important to you when shopping for a (insert product category name)?" Responses to this question did not include the chosen innovative product feature but did include the common features, suggesting that the innovative and the common features selected for Studies 1 and 2 were appropriate.

FIGURE 4.1

Innovative and Non-Innovative Features Used in Studies 1 and 2

Product	Innovative Feature	Non-Innovative Features
Steam Iron	- Preheated water for dripless steaming	- Standard size and weight - Multiple temperature settings
Hand Vacuum	- Performs as steamer or wet/dry vac	- Standard size and weight - Compact for storage
Picture Frame	- LCD screen for digital picture display	- Durable frame material - Includes both a stand and metal hooks for hanging
Desk Lamp	- light diffusing grill to reduce glare	- Standard size - Low heat generation

Dependent Variable

Overall Attitude. A two-item seven point scale anchored by bad/good and unfavorable/favorable was used as a measure of overall attitude. This scale was adapted from other research that considered overall attitudes toward new products that involved either new form (Cox and Cox 2002) or new function (Mukherjee and Hoyer 2001) and is shown in Appendix 2.

Covariates

Three consumer characteristics previously mentioned in the literature as they relate to the evaluation of new products are the need for cognition (NFC) (Cacioppo, Petty, and Kao 1984), the centrality of visual product aesthetics (CVPA) (Bloch, Brunel, and Arnold 2003), and personal innovativeness (Midgley and Dowling 1978; Steenkamp and Gielens 2003). NFC is considered as a covariate as a person's desire or need for further information regarding a product might impact his/her overall attitude and/or behavioral intention toward that product. Furthermore, a person who scores high on CVPA, which is essentially a need for aesthetics, might not be equally as susceptible to changes in attitudes and behavioral intentions that might occur due to innovativeness in form relative to someone who scores low on CVPA. For instance, a person who scores high on CVPA might be more likely to consider form attributes as important, regardless of their real impact on performance. Therefore, this person's reaction to innovativeness in form might be more consistent over time as it is considered to be an important evaluation component. Similarly, a person who scores high on personal innovativeness might be consistently drawn to products innovative in form or function rather than having an attitude and/or behavioral intention that fluctuates over time. In this case, form

innovativeness might be consistently considered important to overall evaluations regardless of whether the product is one typically associated with form or function and vice versa. Because of their potential impact on the stability of attitudes and behavioral intentions during the evaluation of innovative products, these three variables were modeled as possible covariates. NFC was measured using the 18-item seven point scale developed by Cacioppo, Petty, and Kao (1984); CVPA was also captured using the 11-item seven point scale reported in Bloch, Brunel, and Arnold (2003); and finally, personal innovativeness was measured using a 24-item seven point scale reported in Leavitt and Walton (1975) and Roehrich (2004). The items for each of these scales are shown in Appendix 3.

Procedure

Participants were seated in a computer lab and were told they would be evaluating two new products and answering questions regarding these evaluations. The products were viewed and the questionnaire was completed via computer. In addition to verbal instructions, written instructions were also provided on the questionnaire. A copy of the complete questionnaire may be found in Appendix 4. Prior to viewing the products, everyone answered questions regarding the expected innovativeness of four different product categories. They were then prompted via the survey to view the first product. The product slides/pictures to be viewed had been previously loaded on each computer. Participants were told to return to the survey once they had evaluated the first product. Once the questions regarding the first product were completed, the participants were prompted to repeat the entire process for the second product. Each participant evaluated

two products, both from the same expected/actual innovativeness combination. The order of product presentation was counterbalanced to minimize order effects.

After evaluating the two products the first time, participants completed the need for cognition (NFC) and personal innovativeness scales. This task also served as a distraction task, intended to clear short-term memory as much as possible of the answers to the evaluation questions answered prior. Once this task was complete, the participants were prompted to think about the first product again, this time without seeing the product. They once more answered all questions regarding attitudes and behavioral intentions toward this product. The entire process was also repeated for the second product. Finally, participants answered a series of questions on demographics and possible covariates, after which they were thanked and excused.

Data Analysis

Manipulation checks and further validation measures were conducted in the main study and will be discussed in Chapter V. In addition, the respective hypotheses for the study were tested through within-subject planned comparisons using paired-samples t-tests. These tests are appropriate here as the comparison is the individual's attitudes and behavioral intentions measured at time one and time two (Hair, Bush, and Ortinau 2003). The results relating to the main hypotheses are presented next in Chapter V. This is followed by a description of Study 2 and its findings.

CHAPTER V

RESULTS

The purpose of this chapter is to present the results of Study 1 and Study 2 described in Chapter IV. First, a discussion of the results of Study 1 as they apply to the purported hypotheses will be presented. Prior to this, however, specifics regarding the study participants, assessments of reliability and validity, and manipulation checks of multi-item variables are discussed. The chapter continues with a similar description of Study 2 followed by a presentation of its results. A general discussion regarding the overall findings will be presented in Chapter VI along with a discussion of research limitations and suggestions for future research.

Study 1

Participants

One hundred and twenty-two students from undergraduate business and non-business classes were recruited through an extra-credit incentive to participate in the study. This number is sufficient to obtain a power level of 0.90, according to a power analysis in a 2 (high/low form innovativeness) x 2 (form/function expected innovativeness) x 2 (time one/time two) experimental design (see Cohen and Cohen 1988). The overall sample consisted primarily of juniors and seniors and the mean age of the group was 21.47 with an upper limit of 46 and a lower limit of 19. The sample included 126 males and 122 females.

Assessment of Reliability and Validity

Prior to testing the hypotheses, reliability and discriminant validity of the data for the multi-item scales were tested using Cronbach's coefficient alpha (Nunally 1994) and factor analysis respectively (See Table 5.1 and Table 5.2).

Reliability. The reliability of interest here relates to the internal consistency of items used in the multi-item scales of actual form innovativeness, actual function innovativeness, expected form innovativeness, expected function innovativeness, overall attitudes, and behavioral intentions. Reliability of this type indicates that the individual items for a given construct are highly correlated and are therefore measuring that construct (Churchill 1979; Nunally 1994). Alpha scores for actual form innovativeness and actual function innovativeness were .66 and .79 respectively (see Table 5.1). While the reliability score for function innovativeness met the cutoff for acceptable scale items, the score for form innovativeness only met the cutoff for "exploratory" research (.60), as described by Churchill (1979). Because there were only two items making up the scale for form innovativeness, it was not possible to determine the effect of dropping one item on the overall reliability. Instead, a comparison was made with the reliability score calculated based on responses to form innovativeness at t_2 by the same respondents and with responses from a different sample from Study 2 (to be described in a latter section). First, form and function innovativeness scores were collected at both t_1 and t_2, allowing a check of reliability at both times. At t_2, the reliability of the form innovativeness scale was found to be .82, easily surpassing the .70 cutoff. Second, in the case of Study 2, the initial reliability of the form innovativeness scale was found to be .77, surpassing the .70 cutoff. These results, combined with the argument that .66 as a reliability score is both

close to .70 and sufficient for exploratory research suggest that the scale for form innovativeness was sufficiently reliable. Scores for both expected form and function innovativeness were also reliable with scores of .96 and .78 respectively (see Table 5.2). Finally, the multi-item scale for overall attitudes was determined to be reliable (alpha = .94).

TABLE 5.1

Factor Pattern (with VARIMAX Rotation) and Reliability Estimates for Form and Function Innovativeness Constructs

Item	Form Innovativeness	Function Innovativeness	Alpha for the scale
Form1	**.80**	.29	
Form2	**.90**	..01	.66
Function1	.13	**.91**	
Function2	.15	**.89**	.79

Note: Explained Variance = 81%

TABLE 5.2

Factor Pattern (with VARIMAX Rotation) and Reliability Estimates for Expected Form and Expected Function Innovativeness Constructs

Item	Expected Form Innovativeness	Expected Function Innovativeness	Alpha for the scale
FormE1	**.84**	-.26	
FormE2	**. 90**	-.08	.71
FunctionE1	-.07	**.93**	
FunctionE2	-.08	**.93**	.87

Note: Explained variance = 84%

Discriminant Validity. The extent to which test items that appear to be similar are measuring different constructs is tested through discriminant validity. Accordingly, the correlation between items should be low. Convergent validity tests the opposite effect. It tests the degree to which test items that measure the same construct are correlated. Correlations between these items should be high, indicating that they are measuring their intended construct (Hair et al 1998).

Discriminant validity of each of the multi-item scales was checked using principle component factor analysis with a VARIMAX rotation. Through principle component factor analysis, scores for each scale were found to possess discriminate validity as their respective items loaded highly on their respective factors while not loading highly on the other factor. Scores on the two items for *form innovativeness* and *function innovativeness*, for instance, loaded on their respective factors with all scores exceeding .86 while not loading on the opposing factor with the highest loading being .27 (see Table 5.1). In addition, scores on the items for *expected form innovativeness* and *expected function innovativeness* also loaded highly on their respective factors with all scores exceeding .84 while not loading highly on their opposing factors, with the highest loading being -.08 (see Table 5.2). The correlation between the factors was .54 and the highest correlation between individual items was -.29. The correlation matrix for the individual items is included in Table 5.3.

Manipulation Checks

Manipulation checks were performed for the expected innovativeness (Form/Function) of each of the product categories included in the study and for the

TABLE 5.3

Correlation Matrix for Items in Expected Form and Expected Function Innovativeness Constructs

	1	2	3	4
1. FormE1	1.00			
2. FormE2	.55*	1.00		
3. FunctionE1	-.26*	-.04	1.00	
4. FunctionE2	-.29*	-.03	.77*	1.00

*p<.01

perceived actual form innovativeness (High/Low) of each product. The purpose of these manipulation checks was to ensure that the polar cases in each category were present.

Expected Innovativeness by Product Category. The purpose of this manipulation check was to confirm that each product fit the intended category of expected innovativeness (*Form* or *Function*). It was important that the products included were perceived to be high in either expected form or function but not in both. Prior to evaluating any products, each participant answered four seven-point scale questions used in pretesting (two for expected form innovativeness and two for expected function innovativeness) regarding four different product categories. These scales are shown in Appendix 5. The average mean for each construct was calculated and compared for each product using a paired-samples t-test.

As indicated by the results in Table 5.4, there were clear and directional differences between the expected form innovativeness and expected function innovativeness for each of the four product categories considered. As anticipated, expected form innovativeness was higher than expected function innovativeness for both the picture frame and the desk lamp categories with an average difference of 2.37 and .92 respectively. Furthermore, these differences were both statistically significant at the .01

level. For the steam iron and the hand vacuum categories, expected function innovativeness was higher than expected form innovativeness with an average difference of 1.08 and .64 respectively. Again, these differences were both statistically significant at the .01 level.

TABLE 5.4

Manipulation Checks for Expected Innovativeness

Product Category	Expected Form Innovativeness	Expected Function Innovativeness	Absolute Difference (Std. Dev.)[a]
Picture Frame	5.80	3.43	2.37 (2.08)*
Desk Lamp	5.45	4.53	.92 (1.75)*
Steam Iron	4.56	5.64	1.08 (1.51)*
Hand Vacuum	5.08	5.72	.64 (1.31)*

[a]Equal to mean Expected Form Innovativeness minus mean Expected Function Innovativeness.
*$p<.01$ for paired-samples t-test.

To summarize, each of the four product categories considered in this study met the necessary criteria to be considered higher in expected form innovativeness than in expected function innovativeness (i.e. picture frames and desk lamps) or higher in expected function innovativeness than in form innovativeness (i.e., steam irons and hand vacuums).

Actual Innovativeness for Stimuli. The products used in this experiment were pretested to possess either high or low actual form innovativeness. In addition, all products were pretested to possess a high degree of actual function innovativeness. In this section, manipulation checks regarding actual form and function innovativeness are discussed.

It was important to ensure that the manipulation of actual form innovativeness (High/Low) was successful. This was done using a four-item seven point scale. This scale is shown in Appendix 6. Because this was a between-subjects measure, an independent-samples t-test was used. As shown in Table 5.5, the average mean difference was statistically significant at .05 except in the case of the picture frames. In this case, the difference in the form innovativeness between the pictures frames was not statistically significant, despite pretests that suggested otherwise.

TABLE 5.5

Manipulation Checks for Actual Form Innovativeness across High and Low Form Innovativeness Scenarios

Product Category	Product with High Form Innovativeness	Product with Low Form Innovativeness	Difference (Std. Dev.)[a]
Picture Frame	5.65	5.28	.37 (2.43)
Desk Lamp	5.72	4.17	1.36 (2.02)*
Steam Iron	5.26	4.23	1.03 (3.07)**
Hand Vacuum	5.79	5.13	.66 (2.14)**

[a]Equal to mean for Product with High Form Innovativeness minus mean for Product with Low Form Innovativeness .
*p<.01 for independent-samples t-test.
**p<.05 for independent-samples t-test.

Because the manipulation check for the difference in perceived form innovativeness between the high-form picture frame and the low-form picture frame did not validate the needed distinction between these two stimuli, further investigation was warranted. First, the two items that made up the actual form innovativeness scale were considered individually to see which, if not both, of the items was being rated similarly across both the intended high-form stimulus and the intended low-form stimulus. The two items that made up the actual form innovativeness scale were as follows:

Item 1 - There is newness in this product that can be visually identified.

Item 2- There is something distinctive about the way this product looks.

When considering these two items individually, one finds that the average score for item one was 5.93 for the high-form picture frame and 5.97 for the low-form picture frame, resulting in an average difference of -.04. For item 2, the average score was 5.37 for the high-form picture frame and 4.60 for the low-form picture frame, resulting in an average difference of .77. An independent-samples t test indicates that the difference between average scores for item 1 is not statistically significant ($p>.05$) while the difference between average scores for item 2 is highly significant ($p<.01$). These results indicate that the problem in the form innovativeness construct when distinguishing between a high-form and low-form picture frame lies with item 1.

A closer look at item 1 and its relationship to the innovative picture frames suggests that respondents likely considered the innovative *function* feature of the picture frame, the ability to display digital pictures, as at least part of the visually identifiable newness asked about in item 1. In other words, as shown in Appendices 1c and 1d, a picture is displayed in each of the picture frames. It is likely, therefore, that respondents were more likely to agree with the statement, "There is newness in this product that can be visually identified," thinking about the innovative function in addition to or rather than the innovative form, as the digital picture was in fact visible in the illustration of the picture frame. Furthermore, the fact that there was a significant average difference in the responses to item 2, "There is something distinctive about the way this product looks," between the high-form and low-form picture frame indicates that respondents, in general, did recognize the high-form picture frame as more unique or innovative looking.

Therefore, it was concluded that the two picture frames were sufficiently different in their degree of form innovativeness. The fact that the function innovativeness was visible to respondents is important to note, however, and will be considered in the discussion of the study results.

Because function innovativeness was held constant within each product category, its mean average score should not differ between a product with projected high form innovativeness and one with low form innovativeness. Independent-samples t-tests were run within each product category to confirm this and the results are shown in Table 5.6. The difference in each of the four categories was not statistically significant, indicating that perceptions of function innovativeness remained relatively consistent across degrees of form innovativeness.

TABLE 5.6

Manipulation Checks for Actual Function Innovativeness across High and Low Form Innovativeness Scenarios

	Average Mean for Actual Function Innovativeness		
Product Category	**High Form Innovativeness Scenario**	**Low Form Innovativeness Scenario**	**Difference (Std. Dev.)[a]**
Picture Frame	5.60	5.63	-.03 (2.56)
Desk Lamp	5.22	4.57	.65 (2.99)
Steam Iron	5.10	5.00	.10 (2.79)
Hand Vacuum	5.65	5.87	-.22 (2.03)

[a]Equal to mean Function Innovativeness for High Form Innovativeness Scenario minus mean Function Innovativeness for Low Form Innovativeness Scenario.

Covariates

Tests were run for the three potential covariates described previously in Chapter IV: need for cognition (NFC), personal innovativeness, and centrality of visual product

aesthetics (CVPA). A model was set up and run with the attitude change between time one and time two as the dependent variable, the product type as the independent variable (e.g., high expected form innovativeness/ high actual form innovativeness versus high expected form innovativeness/ low actual form innovativeness), and NFC, personal innovativeness, and CVPA as the covariates. As shown in Table 5.7, the F-test for each of the overall models was not statistically significant, indicating a poor fitting model for each of the four product categories considered. These findings were supported by individual relationships between the proposed covariates and attitude change that were generally not statistically significant. The only exception was CVPA, which had a statistically significant effect ($p<.05$) on the attitude change between time one and time two for the steam iron. This relationship was not pursued further, however, due to an overall model fit that was not statistically significant ($p>.10$). The analysis continued, therefore, without further consideration of the four covariates tested here.

Results – Study 1

As stated prior, this research considered functionally innovative products in two contexts: products with *expected form innovativeness* and products with *expected function innovativeness*. Figure 5.1 offers a visual representation of these two contexts and their resulting interactions with *high* and *low actual form innovativeness*, along with the products used as stimuli in Study 1. The results of Study 1 are summarized in Table 5.8 and will be referred to throughout the results section of this chapter.

TABLE 5.7

Results of Search for Covariate Effects on Attitude Change within Each Product Category

	R^2	F-test	p-value
Picture Frame			
Overall Model	.05	.75	(.57)
Product Type		.01	(.98)
NFC		.64	(.43)
CVPA		1.60	(.22)
Personal Innovativeness		1.45	(.24)
Lamp			
Overall Model	.05	.32	(.86)
Product Type		.02	(.89)
NFC		.67	(.42)
CVPA		.40	(.53)
Personal Innovativeness		.02	(.88)
Iron			
Overall Model	.18	1.51	(.23)
Product Type		.03	(.87)
NFC		1.09	(.31)
CVPA		4.45	(.04)
Personal Innovativeness		.03	(.87)
Hand Vac			
Overall Model	.05	.36	(.84)
Product Type		.19	(.66)
NFC		.10	(.76)
CVPA		.16	(.70)
Personal Innovativeness		1.33	(.26)

FIGURE 5.1

A Matrix Illustrating the Combinations of Actual Form Innovativeness and Expected Innovativeness Type Considered in Study 1

Actual Form Innovativeness	Expected Innovativeness Type: Function	Expected Innovativeness Type: Form
High	Cell 1 Steam Iron Hand Vac	Cell 3 Picture Frame Lamp
Low	Cell 2 Steam Iron Hand Vac	Cell 4 Picture Frame Lamp

Context One (Cells 1 and 2)

In this context there are functionally innovative products with expected function innovativeness and high/low actual form innovativeness (Cells 1 and 2). Products in these two scenarios are typically judged based on features related to function. In addition, they either have a high or low degree of form innovativeness. Therefore, there is a potential mismatch between the innovativeness type that has occurred and that which was expected.

The hypothesis relating to Cell 1 (see Figure 5.1) was that overall attitudes would decrease over time. As seen in Table 5.5, the change in overall attitudes was negative (-.39) and significant statistically ($p<.01$) for the steam iron while the change in overall attitudes for the hand vacuum was also negative (-.24) but only approaches statistical

significance ($p<.10$). Therefore, H_1 was strongly supported in the case of the steam iron and moderately supported at best in the case of the hand vacuum.

TABLE 5.8

Summary of Paired-Samples T Tests for Study 1

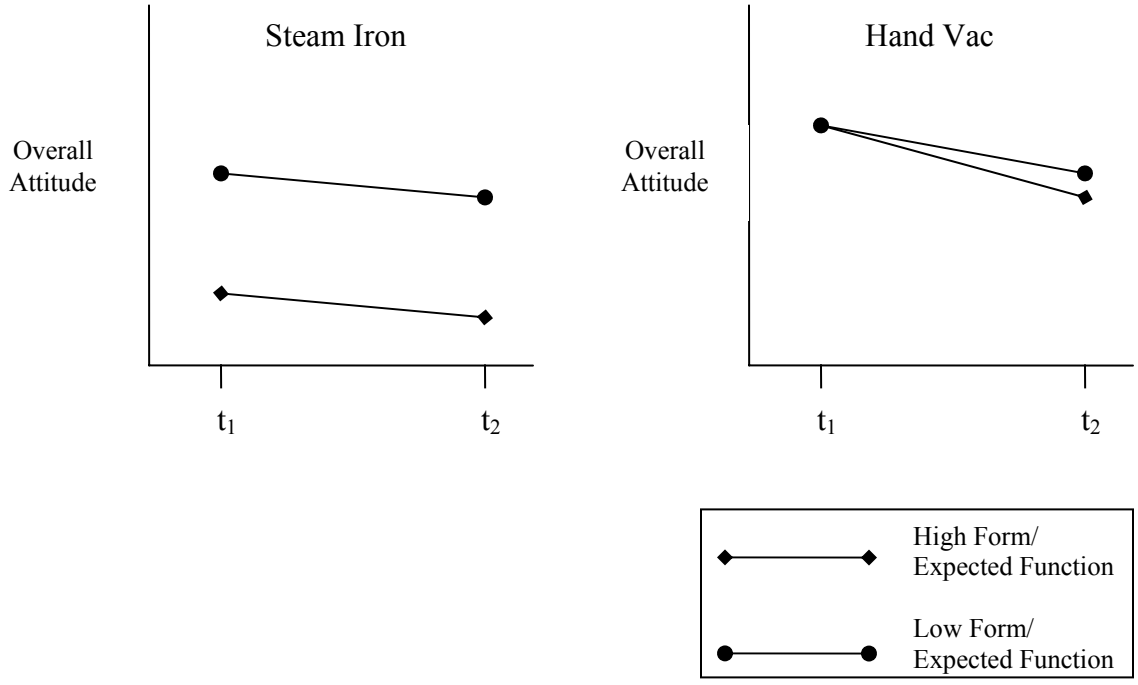
	Mean Attitude (t1)	Mean Attitude (t2)	Mean Attitude Δ	*t* value (sig)
High Form/ Expected Function				
- Steam Iron	4.74	4.36	-.39	-.262 (.01)
- Hand Vac	5.81	5.57	-.24	-1.98 (.06)
Low Form/ Expected Function				
- Steam Iron	5.67	5.30	-.38	-2.58 (.02)
- Hand Vac	5.80	5.63	-.17	-1.28 (.21)
High Form/ Expected Form				
- Picture Frame	6.17	5.78	-.38	-2.37 (.03)
- Desk Lamp	4.10	4.33	.23	1.53 (.14)
Low Form/ Expected Form				
- Picture Frame	5.63	5.63	.00	.00 (1.00)
- Desk Lamp	5.71	5.27	-.45	-3.30 (.003)

In considering Cell 2 (see Figure 5.1), it was hypothesized that any change in attitude over time would be less than in the case of Cell 1 (see Figure 5.1). The actual directional changes in overall attitudes for these cases are demonstrated visually in Figure 5.2. In the case of the steam iron, one sees that the change in overall attitude between time one and time two was consistent when innovativeness in form was high (attitude Δ =

-.39, p<.01) or low (attitude Δ = -.38, p<.01). In the case of the hand vacuum, however, overall attitude decreased to a greater extent when form innovativeness was high (attitude Δ = -.24, p<.10) relative to when it was low (attitude Δ = -.17, p>.10). Therefore, the hypothesis that the change in overall attitude between t_1 and t_2 would be less when form innovativeness was low and function innovativeness was expected was not supported in the case of the steam iron and was partially supported at best for the hand vacuum.

FIGURE 5.2

Comparison of Overall Attitude Change between High Form/ Expected Function Innovativeness and Low Form/ Expected Function Innovativeness Scenarios



Context Two (Cells 3 and 4)

In this context there are functionally innovative products with expected form innovativeness and high/low actual form innovativeness (Cells 3 and 4 in Figure 5.1). Products in these two scenarios are typically judged based on features related to form. In addition, they either have a high or low degree of form innovativeness. Therefore, there is a potential mismatch when there is a low degree of form innovativeness in addition to the existing innovative function.

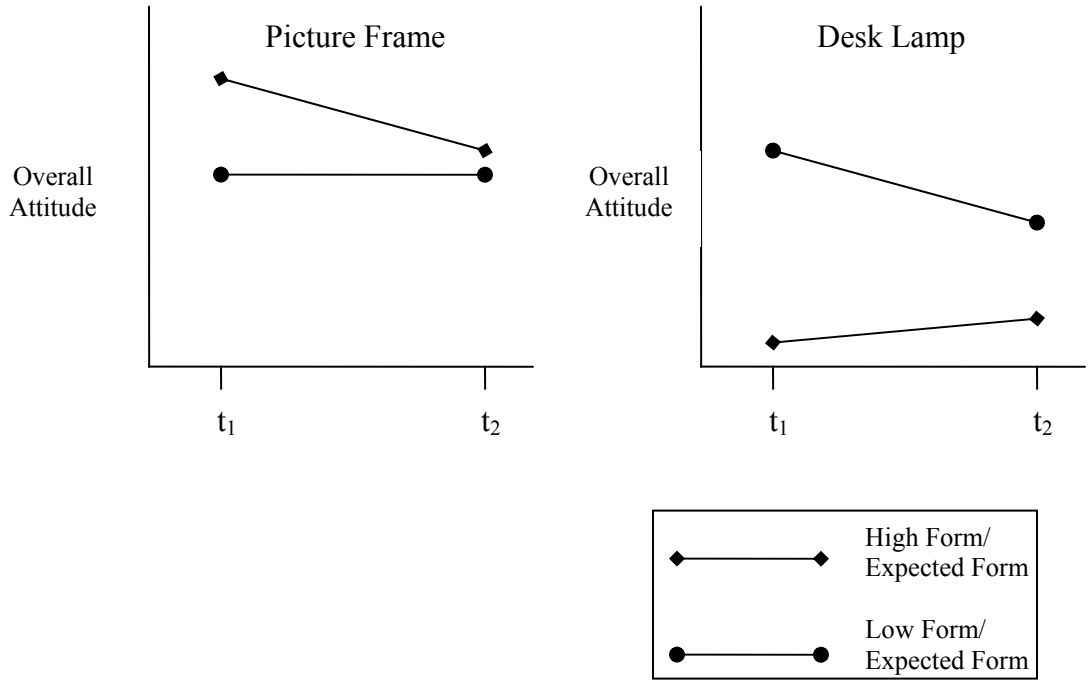
It was hypothesized in H_3 that for a form product that is innovative in form and function (Cell 3 in Figure 5.1) attitudes should decrease between t_1 and t_2. As shown in Table 5.8, H_3 was supported in the case of the picture frame with a decrease in overall attitudes between t_1 and t_2 (-.39) that was statistically significant ($p<.05$). In the case of the lamp, however, the change in overall attitude was not statistically significant ($p>.10$). Therefore, H_3 received partial support.

The change in overall attitudes between $t_1$and t_2 for Cell 4 (see Figure 5.1) was hypothesized to be less than the change in attitudes between t_1 and t_2 for Cell 3 (see Figure 5.1). In this case, the change in overall attitudes was expected to be greater when high form innovativeness was expected and when it occurred relative to when it was expected but did not occur. Figure 5.3 shows support for this hypothesis in the case of the picture frame. When the picture frame possessed innovativeness in form, overall attitudes dropped overall (attitude $\Delta = -.39$, $p<.01$) while they remained constant when the picture frame did not possess form innovativeness (attitude $\Delta = .00$, $p>.10$). Therefore, H_4 received support in the case of the picture frame. In the case of the desk lamp, however, it was the lack of form innovativeness that led to a decrease in overall

attitudes (attitude Δ = -.45, $p<.01$); while the presence of form innovativeness resulted in a slight increase in overall attitudes over time (attitude Δ = .23, $p>.10$). Therefore, H_4 was not supported in the case of the desk lamp.

FIGURE 5.3

Comparison of Overall Attitude Change between High Form/ Expected Function Innovativeness and Low Form/ Expected Function Innovativeness Scenarios



Summary of Study 1 Findings

The overall results of Study 1 suggest that overall attitudes may change over time in the presence of form innovativeness. Specifically, the evidence in Study 1 suggests that, as hypothesized, these changes would be negative when the product category is one in which form innovativeness is expected or one in which function innovativeness is

expected. These changes were not consistent across product categories, however, as they did not decrease at a statistically significant level as expected in the case of the desk lamp and only approached statistical significance in the case of the hand vacuum ($p<.10$). These results suggest that there may be category-specific issues that are impacting overall attitudes and their stability over time.

Rationale for Study 2

A key component of Study 1 was the visual representation of the innovative products at t_1 followed by their absence a t_2. This was done with the intention of more clearly observing form innovativeness and its effects on attention, arousal, etc. at t_1 and contrasting them with a t_2 evaluation based solely on memory of how the product looked. The purpose of Study 2, therefore, was to observe any differences in attitude change when the visual representation of the products was allowed at both t_1 and t_2. The results could then be compared to Study 1 to further evaluate how form innovativeness impacts the evaluation of functionally innovative products over time.

Study 2

There is one major difference between Study 2 and Study 1 that is considered important in further understanding how form innovativeness impacts attitudes toward functionally innovative products. This difference is the visual representation of the innovative product shown to study participants at both t_1 and t_2. Recall that respondents were only allowed to see the picture of the innovative product at t_1 in Study 1. This was done with the purpose of isolating the effect of form innovativeness by taking away its visual representation at t_2. Accordingly, it was expected that attention, arousal, and other variables impacted by visual novelty would be reduced at t_2, resulting in an overall

attitude based more on cognitive issues relating to memory of the product. Study 2 attempts to isolate further the impact of visual stimulus representation on attitudes by offering a visual representation of the product at both t_1 and t_2. It is expected that the results should differ from those in Study 1 as the visual representation is expected to have a more continued influence on attitudes across both t_1 and t_2. Research in repeated exposure suggests that it commonly takes more than two exposures for the influence of visual novelty on stimulus liking to wear off (e.g., Bornstein 1989). Accordingly, it is hypothesized here that overall attitudes will remain more consistent when a visual representation of the innovative form is present at t_2 relative to when it is absent.

H5: Products that are innovative in both form and function will change less when a visual representation of the product is present at both t_1 and t_2 relative to when the product is absent at t_2.

Participants

Similar to in Study 1, one hundred and ninety-three students from undergraduate business and non-business classes were recruited through an extra-credit incentive to participate in the study. This number is sufficient to obtain a power level of 0.90 (see Cohen and Cohen 1969). Once again, the overall sample consisted primarily of juniors and seniors and the mean age of the group was 21.15 with an upper limit of 34 and a lower limit of 19. The sample included 82 males and 111 females.

Assessment of Reliability and Validity

As with Study 1, reliability and discriminant validity of the data for the multi-item scales were tested using Cronbach's coefficient alpha (Nunally 1979) and factor analysis respectively (See Table 5.9 and Table 5.10).

Reliability. Scores for both form and function innovativeness scales were found to be reliable, with alpha scores of .77 and .76 respectively (see Table 5.9). Furthermore, scores for both expected form and function innovativeness were also reliable with a score of .78 for each scale (see Table 5.10). Finally, the multi-item scale for overall attitudes was determined to be reliable (alpha = .93) as was the multi-item scale for behavioral intention (alpha = .92). Once again, all of these scores exceed the minimum recommended score of .70 for acceptable scale items (Churchill 1979).

TABLE 5.9

Factor Pattern (with VARIMAX Rotation) and Reliability Estimates for Form and Function Innovativeness Constructs

Item	Form Innovativeness	Function Innovativeness	Alpha for the scale
Form1	**.87**	.22	
Form2	**.90**	.12	.77
Function1	.21	**.88**	
Function2	.15	**.90**	.76

Note: Explained Variance = 81%

TABLE 5.10

Factor Pattern (with VARIMAX Rotation) and Reliability Estimates for Expected Form and Expected Function Innovativeness Constructs

Item	Expected Form Innovativeness	Expected Function Innovativeness	Alpha for the scale
FormE1	**.87**	-.23	
FormE2	**. 92**	.03	.78
FunctionE1	-.10	**.93**	
FunctionE2	-.12	**.93**	.78

Note: Explained variance = 71%

Discriminant Validity. Discriminant validity of each of the multi-item scales was checked using principle component factor analysis with a VARIMAX rotation. Through principle component factor analysis, scores for each scale were found to possess discriminate validity as their respective items loaded highly on their respective factors while not loading highly on the other factor. Scores on the two items for *form innovativeness* and *function innovativeness* loaded on their respective factors with all scores exceeding .87 while not loading on the opposing factor with the highest loading being .22 (see Table 5.9). The correlation between the factors was .71 and the highest correlation between individual items was .38. The correlation matrix for the individual items is included in Table 5.11. Scores on the items for *expected form innovativeness* and *expected function innovativeness* also loaded highly on their respective factors with all scores exceeding .87 while not loading highly on their opposing factors, with the highest loading being -.23 (see Table 5.12). The correlation between the factors was .69 and the highest correlation between individual items was -.30. The correlation matrix for the individual items is included in Table 5.12.

TABLE 5.11

Correlation Matrix for Items in Form and Function Innovativeness Constructs

	1	2	3	4
1. Form1	1.00			
2. Form2	.63*	1.00		
3. Function1	.38*	.27*	1.00	
4. Function2	.28*	.27*	.63*	1.00

*p<.01

TABLE 5.12

Correlation Matrix for Items in Expected Form and Expected Function Innovativeness Constructs

	1	2	3	4
1. FormE1	1.00			
2. FormE2	.63*	1.00		
3. FunctionE1	-.28*	-.12	1.00	
4. FunctionE2	-.30*	-.12	.76*	1.00

*p<.01

Manipulation Checks

Expected Innovativeness by Product Category. As was done in Study 1, the average mean for each construct was calculated and compared for each product using a paired-samples t-test. As indicated by the results in Table 5.13, there were clear and directional differences between the expected form innovativeness and expected function innovativeness for each of the four product categories considered. Once again, expected form innovativeness was higher than expected function innovativeness for both the picture frame and the desk lamp categories with an average absolute difference of 2.46 ($p<.01$) and .69 ($p<.05$) respectively. For the steam iron and the hand vacuum categories, expected function innovativeness was higher than expected form innovativeness with an average absolute difference of .99 ($p<.01$) and .54 ($p<.01$) respectively. To summarize, as was the case in Study 1, each of the four product categories considered in Study 2 met the necessary criteria to be considered higher in expected form innovativeness (i.e. picture frames and desk lamps) or higher in expected function innovativeness (i.e., steam irons and hand vacuums), with none of the four considered to be equally innovative in expected form and function innovativeness.

TABLE 5.13

Manipulation Checks for Expected Innovativeness

Product Category	Expected Form Innovativeness	Expected Function Innovativeness	Absolute Difference[a] (Std. Dev.)
Picture Frame	5.68	3.22	2.46 (1.97)*
Desk Lamp	5.55	4.87	.69 (1.87)*
Steam Iron	4.67	5.66	.99 (1.53)*
Hand Vacuum	5.00	5.54	.54 (1.27)*

[a]Equal to mean Expected Form Innovativeness minus mean Expected Function Innovativeness.
*p<.01 for paired-samples t-test.

Actual Innovativeness for Stimuli. In this section, manipulation checks regarding actual form and function innovativeness for Study 2 are discussed.

An independent-samples t test was conducted and the average mean difference between high actual form innovativeness and low actual form innovativeness was statistically significant at the .01 level (see Table 5.14). Therefore, the high-form innovativeness and low form-innovativeness products were found to be sufficiently different in each of the four product categories.

TABLE 5.14

Manipulation Checks for Actual Form Innovativeness across High and Low Form Innovativeness Scenarios

Product Category	High Form Innovativeness	Low Form Innovativeness	Difference[a] (Std. Dev.)
Picture Frame	5.88	5.16	.72 (2.55)*
Desk Lamp	5.97	4.16	1.81 (2.67)*
Steam Iron	4.85	3.94	.91 (3.25)*
Hand Vacuum	5.76	4.67	1.09 (2.60)*

[a]Equal to mean Expected Form Innovativeness minus mean Expected Function Innovativeness.
*p<.01 for independent-samples t-test.

As was done in Study 1, independent-samples t-tests were run within each product category to confirm perceived actual function innovativeness across low and high

form innovativeness scenarios and the results are shown in Table 5.15. Once again, the difference in each of the four categories was not statistically significant, suggesting that perceptions of actual function innovativeness remained consistent across degrees of form innovativeness.

TABLE 5.15

Manipulation Checks for Actual Function Innovativeness across High and Low Form Innovativeness Scenarios

	Average Mean for Actual Function Innovativeness		
Product Category	**High Form Innovativeness Scenario**	**Low Form Innovativeness Scenario**	**Difference [a] (Std. Dev.)**
Picture Frame	5.60	5.52	-.08 (2.82)
Desk Lamp	4.84	5.29	-.45 (2.57)
Steam Iron	4.72	4.84	-.12 (3.00)
Hand Vacuum	5.42	5.85	-.22 (2.37)

[a]Equal to mean Function Innovativeness for High Form Innovativeness Scenario minus mean Function Innovativeness for Low Form Innovativeness Scenario.

Results – Study 2

As stated prior, Study 2 was identical to Study 1 in considering functionally innovative products in two contexts: products with *expected form innovativeness* and products with *expected function innovativeness* (see Figure 5.1). Because H_5 deals specifically with those instances when form innovativeness is present, only those cases are analyzed here. The results are summarized in Table 5.16.

The results of Study 2 show that there were no statistically significant differences found between overall attitudes at t_1 and overall attitudes at t_2, except in the case of the desk lamp. Overall, these results suggest that a lack of a visual representation of the

innovative products at t_2 (as occurred in Study 1) may be partially responsible for the decrease in overall attitudes over time when innovativeness in form was present. Overall attitudes remained relatively consistent when a visual representation of the innovative product was present at both t_1 and t_2 (as occurred in Study 2) suggesting that the form innovativeness had a continual effect across both exposures. Thus, H_5 was supported.

TABLE 5.16

Summary of Paired-Samples T Tests for Study 2

	Mean Attitude (t1)	**Mean Attitude (t2)**	**Mean Attitude Δ**	***t* value (sig)**
High Form/ Expected Function				
- Steam Iron	4.84	4.64	-.20	-1.69 (.10)
- Hand Vac	5.51	5.48	-.03	-.31 (.76)
High Form/ Expected Form				
- Picture Frame	5.78	5.76	-.02	-.15 (.88)
- Desk Lamp	4.20	4.24	-.05	-.34 (.74)

Post Hoc Tests

While Studies 1 and 2 do offer some support for the impact of form innovativeness on overall attitude change for functionally innovative products, there were instances where statistically significant results did not appear. Furthermore, there were instances were overall attitudes changed over time in the presence of function innovativeness only. The purpose of these post hoc tests, therefore, is to explore alternative influences that product innovativeness might have in the product evaluation

process. Specifically, alternative dimensions of attitudes that were measured during data collection in Study 1 and 2 are analyzed next.

Alternative Dimensions of Attitudes to Consider

While the results discussed prior regarding Study 1 and Study 2 were based on overall attitudes, there are other dimensions of attitudes that past research suggests might be valuable when considering evaluations of form and function products. These dimensions include *hedonic* (i.e., related to pleasure) and *utilitarian* (i.e., related to usefulness) attitudes.

The rationale for considering these attitude dimensions here lies in the theoretical and empirical suggestions that they are related to a product's aesthetic and function characteristics respectively (Batra and Ahtola 1991; Spangenberg, Voss, and Crowley 1997; Voss, Spangenberg, and Grohmann 2003). Thus, it may be that innovativeness in form and innovativeness in function influence these dimensions of attitudes in different ways. Furthermore, the stability of each dimension might differ as hedonic reactions are supposed to be more emotional while utilitarian reactions should be more cognitive (Spangenberg, Voss, and Crowley 1997; Voss, Spangenberg, and Grohmann 2003). Thusly, emotional reactions may affect attitudes and behavioral intentions temporarily while cognitive reactions might have more of a permanent impact. Finally, in the presence of both form and function innovativeness, one might expect an interaction of hedonic and utilitarian attitudes and their impact on behavior intentions over time. Accordingly, a hedonic reaction may occur first followed by a utilitarian reaction to the innovative features in form.

Hedonic and utilitarian attitudes were measured in both studies based on scales taken from prior research dedicated to scale development in the area of hedonic and utilitarian attitudes (Voss, Spangenberg, and Grohmann 2003). Accordingly, a seven-point scale comprised of five items was used to measure hedonic attitude toward each product (See Appendix 2). These items were anchored by not fun/fun, dull/exciting, not delightful/delightful, not thrilling/thrilling, and unenjoyable/enjoyable. Similarly, utilitarian attitude was also measured using a seven-point scale that included items anchored by ineffective/effective, unhelpful/helpful, not functional/functional, unnecessary/necessary, and impractical/practical (see Appendix 2). The reliability of the items measuring the hedonic dimension was high (Cronbach's alpha = .94) as was that of the items measuring the utilitarian dimension (Cronbach's alpha = .89).

The results (see Table 5.17) offer preliminary insights into the impact of form and function innovativeness on hedonic and utilitarian attitudes over time. First, similar to what occurred with overall attitudes, the lack of a visual stimulus at t_2 (Study 1) results in more statistically significant changes in attitudes relative to when the visual stimulus is present at t_2 (Study 2). Second, more of these changes are in utilitarian rather than hedonic attitudes when form innovativeness is present. This suggests that form innovativeness may initially appear to be of functional benefit to functional products but its value decreases over time, resulting in a utilitarian attitude that changes.

In considering the changes in hedonic and utilitarian attitudes in Study 1, one sees that when form innovativeness is present, all statistically significant attitude change is utilitarian. Specifically, in the case of the hand vacuum, there is a negative change in utilitarian attitude ($\Delta = -.32$, $p<.05$). This supports the argument made prior that there

may be a temporary reaction to form innovativeness when it is applied to a function product. In this case the temporary attitude appears to manifest itself in the decrease of the functional or utilitarian value of the innovativeness in form rather than a decrease in the hedonic or emotional reaction to the product. When form innovativeness is applied to a form product, there is an increase in the utilitarian attitude for both the picture frame ($\Delta = .25$, $p<.10$) and the desk lamp ($\Delta = .28$, $p<.05$). This offers support for the argument made prior that the absence of the product at t_2 removes the distraction caused by the

TABLE 5.17

Hedonic and Utilitarian Attitude Changes in Studies 1 and 2

	Mean Attitude Change			
	Study 1		Study 2	
	Hedonic	Utilitarian	Hedonic	Utilitarian
High Form/ Expected Function				
- Steam Iron	.20	-.03	.01	-.20*
- Hand Vac	.02	-.32*	-.01	.05
Low Form/ Expected Function				
- Steam Iron	-.34*	-.13	-.12	-.08
- Hand Vac	-.13	-.07	-.09	-.11
High Form/ Expected Form				
- Picture Frame	-.04	.25**	.19**	.31*
- Desk Lamp	.03	.28*	.01	.23
Low Form/ Expected Form				
- Picture Frame	-.17**	.14	-.01	.13
- Desk Lamp	-.07	-.40*	-.04	-.03

*p<.05
**p<.10

form innovativeness and allows a better assessment of the function innovativeness and its utilitarian value at t_2. Finally, it is interesting to note that there were not statistically significant changes in hedonic attitudes when form innovativeness was present in Study 1. Thus, it appears that it might be the usefulness or utilitarian value of form innovativeness that becomes more important at t_2 rather than the hedonic or emotional value of the innovativeness in form.

In Study 2, when the product was visually represented at t_1 and t_2, there are similar changes in utilitarian attitudes when form innovativeness was present in addition to function innovativeness. Specifically, the utilitarian attitude regarding the steam iron decreased to a statistically significant degree ($\Delta = -.20$, $p<.05$). Again, it appears the utilitarian value of the form innovativeness decreased over time when it is applied to a function product. In addition, utilitarian attitudes increased in the case of the picture frame when form innovativeness was present along with function innovativeness ($\Delta = .31$, $p<.05$). Thus, it appears that, over time, either the function or form innovativeness was valued more, even when the product was present at t_1 and t_2.

In summary, it is interesting to note that the attitude change that seemed most prevalent when form innovativeness was present was utilitarian. This suggests that it might not be the hedonic value of the form innovativeness that is impacted by visual innovativeness but instead, it might be the usefulness or utilitarian value of this innovativeness that changes over time.

CHAPTER VI

DISCUSSION OF FINDINGS AND SUMMARY

The research described in this dissertation consisted of two studies that sought to empirically investigate whether innovativeness in form differently affects functionally innovative products over time depending on the product type (form versus function). Study 1 consisted of two exposures to each stimulus with the first exposure including a visual representation of the product and exposure two consisting of the name of the product only, without an accompanying visual representation. Study 2 was identical to Study 1 with the exception being that the visual representation of the product occurred at both t_1 and t_2. A summary of the findings of both Study 1 and Study 2 is presented next. This is followed by implications for managers and researchers. Finally, limitations and suggestions for future research are presented.

Impact of Expected/Actual Product Innovativeness on Overall Attitude Change

As demonstrated in both Study 1 and Study 2, the presence of form innovativeness does seem to impact initial attitudes and subsequent attitudes toward functionally innovative products. Consistent with H_1, Study 1 indicated that attitudes toward functionally innovative products where function innovativeness was expected decreased over time when form innovativeness was also present, at least in the case of the innovative steam iron. This offers support to the argument made prior that innovativeness in form may initially trigger an engagement in central processing because form attributes are perceptual and easier to process than verbal text (Edell and Staelin 1983). Furthermore, the novelty of the innovative feature causes an increase in attention (e.g., Berlyne 1960, 1970; Kagan 2002) and elaborate processing (Fiske 1982; Mandler

1982). Because the innovativeness in form is a peripheral cue (i.e., not relevant to the product's performance) in the case of a function product such as a steam iron, however, its initial perceived importance appears to change over time, resulting in a decrease in overall attitude. This supports prior research which argues that attitudes are less stable when they are based on peripheral rather than central cues (Petty and Cacioppo 1984). Therefore, the unexpectedness of innovativeness in form leads to an initial increase in momentary attitudes that decreases at t_2 when the visual representation of the product is absent. Attitudes at t_2, therefore, seem to be increasingly determined by issues more germane to the product category (e.g., function issues in this case).

The influence of form innovativeness in this scenario was further supported in Study 2 when a visual representation of the product was present at both t_1 and t_2. In this case, attitudes remained consistent, indicating that the continued presence of the product sustained the influence of form innovativeness on overall attitudes. This finding is consistent with other research in novelty and mere exposure that suggests that liking changes when the number of exposures is greater than two (see Bornstein 1989 for a summary of this literature). Because there were only two exposures in this research, the influence of form innovativeness remained strong across both exposures.

The second hypothesis supported by this research was that overall attitudes would also change when both form innovativeness and function innovativeness were present for a form product. This hypothesis was strongly supported in the case of the picture frame in Study 1. This result supports the theoretical argument that the presence of form innovativeness would dominate overall attitudes at t_1 due to its visual nature and its expectedness. At t_2, the absence of a visual representation of the product would lead to

an attitude based more on memory. Accordingly, form innovativeness was not as influential at t_2 while functional innovativeness was considered more fully. Again, Study 2 lends further support for the results of Study 1 as overall attitudes remained consistent between t_1 and t_2, indicating that the visual representation of the product allowed the form innovativeness to dominate the product evaluation, at least across two exposures.

Results from Study 1 also supported the hypothesis that the change in overall attitudes would be greater for form products innovative in form and function relative to those form products innovative in function only. Specifically, attitudes toward the picture frame that was innovative looking and possessed an innovative function decreased over time more than attitudes toward the picture frame that was innovative in function only. This supported the theoretical argument that the innovativeness in form would have a greater impact on initial attitudes than would innovativeness in function due to its visual presence. Without the presence of the product at t_2, however, the impact of form innovativeness appeared to decrease while the lack of form innovativeness for the other product resulted in a more consistent attitude.

The final hypothesis supported by this research involved a comparison of the attitude change toward products innovative in form when a visual representation of the product was only available at t_1 (Study 1) and when it was available at t_1 and t_2 (Study 2). The hypothesis was that the change would be greater when the visual representation was available only at t_1. The results supported this hypothesis. The significant findings from Study 1 were not present in Study 2, indicating that the effects of form innovativeness persisted when the product was present at t_1 and t_2 while they decreased when the product was only present at t_1. These results suggest that form innovativeness has an impact that

goes beyond two exposures. Furthermore, the impact of form innovativeness decreases, or the impact of other stimulus features increases, when a visual representation of the stimulus is not present beyond the initial exposure.

Implications of Findings

The findings in this research have important implications for both managers and researchers in the area of product innovativeness.

Implications for Managers. Managerial implications can be drawn from this research in two main areas: new product testing and product display. In the area of new product testing, this research suggests that all may not be as it seems when consumers first evaluate and rate products that are innovative in form. Specifically, attitude assessments may change over time. Assuming that initial assessments of innovative products during test-marketing are visual, they will likely be heavily influenced by the presence of form innovativeness. Furthermore, this influence might be amplified due to the unexpectedness of the innovative form if the product is one that is primarily evaluated on features other than form. Subsequent product assessments when the product is not present, however, might change as the influence of form innovativeness lessens. Therefore, new product managers should assess consumer attitudes toward products that are innovative in form both in the presence of and then in the absence of the innovative product. In this way, a more accurate assessment of how consumers go through the product evaluation process over time can determined.

Regarding new product display, the finding that attitudes toward new products with innovative form change in the absence of a visual representation of the product is potentially important to the way these products are displayed. Specifically, the

persistence of visual effects on attitudes across at least two exposures suggests that retailers should allow consumers to see new products multiple times during a shopping experience. Displaying these products according to their appropriate category and in a separate aisle display, for instance, might assist consumers in maintaining positive attitudes toward these products, thus enhancing the likelihood of purchase.

Implications for Researchers. The results of this research offer important insights for research in the area of product innovativeness. First, the findings regarding form innovativeness applied to function products may be applied to what commonly happens in the marketplace. Household items such as appliances and tools frequently offer unique visual designs to accompany new models of products with innovative function features. While past academic research has considered innovativeness in form for products that are traditionally form products (e.g., Cox and Cox 2002), the research presented here considered those cases when form innovativeness is not expected and does not directly enhance product performance. Work in ELM has traditionally focused on peripheral cues in the area of advertising when considering central and peripheral routes of persuasion. Peripheral cues have included characteristics of the product endorser (e.g., Andrews and Shimp 1990; Petty, Cacioppo, and Schumann 1983) and issues relating to the advertisement itself (e.g., Duncan and Nelson 1985; Park and Young 1986). What this dissertation has tried to address are peripheral cues of the product itself (i.e., product characteristics that are not important to product performance). The results suggest that product form is a product characteristic that can be innovative while not necessarily being related to a product's performance. Furthermore, its impact on product liking appears to change over time, depending on its perceived importance to the overall product

performance. Future research, therefore, might expand this focus on product characteristics as peripheral cues in ELM and their potential to influence attitudes and behavior toward new products.

Second, this research has demonstrated that reactions to innovative visual stimuli change over time when stimuli are not present beyond the initial evaluation. Therefore, in addition to mere exposure effects that have been demonstrated to change attitudes toward novel stimuli over time (e.g., Berlyne 1970, 1974), there are also issues relating to the memory of novel stimuli and how this memory impacts attitudes over time. In other words, there appear to not only be changes in liking of a novel stimulus across multiple exposures, as shown in prior novelty research (e.g., Berlyne 1970, 1974), but there also seem to be changes when the novel stimuli are seen only once. So, novelty may impact attitudes through multiple exposures (i.e., at least more than two) or through its impact on memory of the novel stimulus.

Third, there seems to be value in seeking to understand momentary attitudes and how they change in the context of innovative products. Form innovativeness applied to function products, for instance, does appear to, at times, impact initial attitudes and this impact decreases over time. This supports past theoretical work that has implied an inverse relationship between familiarity and momentary attitudes toward a stimulus (Ortony, Clore, and Collins 1988). In addition to the dispositional attitudes that come from past experiences with a particular stimulus, therefore, one must consider the impact of the emotions that are generated from the novelty of the stimulus and how these emotions might change over time.

Limitations and Directions for Future Research

While the results of this research certainly apply to various contexts where product innovativeness is involved, there are limitations that should be noted and taken into consideration for purposes of future research. These limitations are addressed next. Finally, directions for future research in the area of product innovativeness in form and attitudes are suggested.

Limitations

Stimuli. It was important in this research to use real products with real innovations to increase its simulation to what occurs in the marketplace. The tradeoff is that the experimental control was probably somewhat compromised. Differences in innovative features (e.g., digital picture display for a picture frame versus light grid for a desk lamp) and their characteristics (e.g., color, shape, etc.) might have impacted evaluations between products, making it more difficult to observe consistent effects within experimental cells. Future research might focus more on more consistent features between product categories.

Realism in Evaluation Context. Because these studies were conducted in a computer lab and products were not actually present during evaluation, generalization to real shopping contexts might not be appropriate across all cases, though it could be reasonably compared to shopping on the Internet. Future research should consider performing similar experiments in actual stores with the products present for more in-depth evaluations.

Lack of Polar Cases for Form and Function Innovativeness. While the stimuli used in this study did meet the requirements from a "statistical significance" standpoint,

meaning they were separated by innovativeness expectedness (form versus function) and actual form innovativeness (high versus low) at a statistically significant level, they were not necessarily the polar cases in each scenario. This might have contributed to the lack of consistent findings across product categories. For instance, the average expected innovativeness in Study 1 on a 1 to 7 likert-type scale for the steam iron (5.08) was significantly less than the expected function innovativeness (5.72) at the .01 level. Polar cases, however, would have been represented by averages more toward 0 for expected form innovativeness and even perhaps more toward 7 for expected function innovativeness. If this were the case, perhaps, the resulting differences between attitudes at t_1 and t_2 would have been stronger. The same argument could be made for the degree of actual form innovativeness across high and low scenarios. While this is a limitation of this study, one might argue that polar cases rarely exist across most product categories. Nevertheless, including those cases, if they can be found, would potentially result in stronger results. Future research might consider, therefore, scenarios that include polar cases of form and function innovativeness.

Student Sample. Generalization of the findings of this research is limited as the findings are based on a sample that consisted entirely of college students. While they are certainly familiar with making decision regarding products, it is conceivable that their general demographics (e.g., age, income, and education level) might influence their attitudes toward certain products, relative to other segments of the consumer population. Furthermore, the fact that participants received extra credit for participating in the study might have influenced their involvement with and concern regarding the experiment, thus limiting its generalizability to other population segments. Future research, therefore,

should examine changing attitudes toward innovative products using other consumer segments.

Lack of Baseline Attitude Measurement. This research did not include a baseline measurement for the products in each actual/expected innovativeness category. In other words, there was no assurance that respondents would initially like each of the products to a statistically equal degree. Therefore, the change in attitudes might have been partly due to the differences in initial degree of liking/disliking of the various product categories. Future research might seek to establish a baseline in liking in order to eliminate the possible variance that might be caused by differences in initial liking.

Assumptions Regarding Cognitive Activity during Evaluation Process. Various assumptions were made regarding the cognitive activities of the study respondents in both Study 1 and Study 2. Though some of these assumptions were addressed to a limited degree through process tracing in the exploratory research described prior, the number of survey questions asked and the potential for demand effects prevented the same type of tracing during the main studies. Therefore, there remains room for argument regarding what innovative features (form versus function) were being evaluated, and when and which of them specifically impacted attitudes and attitude change. Future research, therefore, might focus more on an in-depth, verbal protocol format across a large sample that allows this type of information to be captured.

Directions for Future Research

In addition to future research that addresses the limitations mentioned above, there are others that would seemingly move the work in product innovativeness forward. These include 1) the potential impact of form innovativeness on actual behavior, 2) how

degrees of form innovativeness might impact attitudes and behavior differently, and 3) potential interactions with other product characteristics.

Potential Impact of Form Innovativeness on Actual Behavior. Creating scenarios where choice is involved would allow an analysis of when form innovativeness actually leads to a change in purchase behavior. A common concern with research involving attitudes and/or behavioral intentions is the disconnect that often occurs between the attitudes/behavioral intentions and actual behavior (Belk 1985). Analyzing the impact of form innovativeness on actual purchase or choice behavior toward new products would certainly add value to what is known about product innovativeness. While attitudes toward products innovative in form might change over time, it may not be the same regarding actual product choice. Indeed, measures of behavioral intentions were collected in both Study 1 and Study 2 above and remained relatively consistent over time across all combinations of expected innovativeness type and actual form innovativeness indicating that other factors may be at work when considering behavior toward innovative products.

Differential Impact of Degrees of Form Innovativeness on Attitudes and Behavior. Schema congruency applied to issues of "fit" between brands and new products suggests that a moderate degree of fit is most effective (e.g., Myers-Levy and Tybout 1989). This idea of fit has also been applied to issues of form with results indicating that consumers prefer form illustrations (i.e., black and white drawings of products) that are either prototypical or extremely incongruent to its given category (Veryzer, Jr. and Hutchinson 1998). The study did not, however, consider how this preference changed over time. It could be, therefore, that consumers prefer a certain degree of form innovativeness relative

to others. Future research might therefore consider degrees of form innovativeness with actual products and their relationship to attitudes and behavior toward new products.

Potential Interactions with Other Product Characteristics. Future research might consider how form innovativeness impacts perceptions of product quality, durability, etc. and what this does to overall product evaluations. For instance, Belch (1995) points out that form potentially impacts perceptions of durability. One might ask, therefore, how innovativeness in form impacts this and/or other characteristics. In addition to product liking, it could be that innovativeness in form sends signals to consumers regarding price, quality, durability, etc. Furthermore, these signals may also change over time.

Conclusion

This research focused on form as a dimension of product innovativeness and its impact on attitudes toward innovative products. Furthermore, the question of whether that impact would change over time was also considered. The results of two studies indicate that form innovativeness does indeed have a changing impact on the liking of innovative products when the products are seen only once. Furthermore, this change is not necessarily in the emotional or hedonic reaction to the form innovativeness, but may be in its utilitarian value. Finally, this change occurs when the innovativeness in form is applied to a form product and when it is applied to a function product. Therefore, form innovativeness appears to be a new product characteristic that should be considered of varied importance to initial and subsequent attitude assessments depending on the product type and the consumers' reliance on memory about the product after the initial exposure.

REFERENCES

Aaker, David A. and Kevin Lane Keller (1990), "Consumer Evaluations of Brand Extensions," *Journal of Marketing*, 54 (January), 27-41.

Ajzen, I. (1991), "The Theory of Planned Behavior," *Organizational Behavior and Human Decision Processes*, 50, 179-211.

_____ (1996), "The Directive Influence of Attitudes on Behavior," in *The Psychology of Action: Linking Cognition and Motivation to Behavior* P. M. Gollwitzer and J. A. Bargh, eds. New York: Guilford, 35-403.

_____ and M. Fishbein (1980), "Attitude-Behavior Relations: A Theoretical Analysis and Review of Empirical Research," *Psychological Bulletin*, 84, 888-918.

Ali, Abdul, Robert Krapfel, Jr., and Douglas LaBahn (1995), "Product Innovativeness and Entry Strategy: Impact on Cycle Time and Break-even Time," *Journal of Product Innovation Management*, 12, 54-69.

Anderson, Philip and Michael L. Tushman (1990), "Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change," *Administrative Science Quarterly*," 35 (December), 604-33.

Andrews, J. Craig and Terence A. Shimp (1990), "Effects of Involvement, Argument, Strength, and Source Characteristics on Central and Peripheral Processing of Advertising," *Psychology and Marketing*, 7 (Fall), 197-214.

Andrews, Jonlee and Daniel C. Smith (1996), "In Search of the Marketing Imagination: Factors Affecting the Creativity of Marketing Programs for Mature Products," *Journal of Marketing Research*, 32 (May), 174-87.

Appelbaum, Cara, Matthew Grimm, Amy E. Gross, Laura Bird, Dan Koeppel, and David Kiley (1990), "Why Products Fail," *Adweek's Marketing Week*, 31 (45), 20-23.

Atuahene-Gima, Kwaku (1995), "An Exploratory Analysis of the Impact of Market Orientation on New Product Performance: A Contingency Approach," *Journal of Product Innovation Management*, 12, 275-93.

_____ and Felicitas Evangelista (2000), "Cross-Functional Influence in New Product Development: An Exploratory Study of Marketing and R&D Perspectives," *Management Science*, 46 (October), 1269-84.

Batra, Rajeev and Olli T. Ahtola (1990), "Measuring the Hedonic and Utilitarian Sources of Consumer Attitudes," *Marketing Letters*, 2 (2), 159-70.

Beale, Stephen (1999), "Flavorful iMacs Debut," *Macworld*, 16 (March), 28-29.

Belk, Russell W. (1985), "Issues in the Intention-Behavior Discrepancy," *Research in Consumer Behavior*, 1, 1-34.

Berkowitz, Marvin (1987), "Product Shape as a Design Innovation Strategy," *Journal of Product Innovation Management*, 4, 274-83.

Berlyne, D. E. (1960), *Conflict, Arousal and Curiosity*, New York: McGraw-Hill.

_____ (1970), "Novelty, Complexity, and Hedonic Value," *Perception and Psychophysics*, 8, 279-86.

_____ (1971), *Aesthetics and Psychobiology*, New York: Meredith Corporation.

_____ (1974), "Novelty, Complexity, and Interestingness," in *Studies in the Experimental Aesthetics: Steps Toward an Objective Psychology of Aesthetic Appreciation*, D. E. Berlyne, ed. Washington: Hemisphere Pub. Corp., 175-80.

Bettman, James R. (1979), *An Information Processing Theory of Consumer Choice*, Reading, MA: Addison-Wesley Pub. Co.

Bhoovaraghavan, Sriraman, Ashok Vasudevan, and Rajan Chandran (1996), "Resolving the Process vs. Product Innovation Dilemma: A Consumer Choice Theoretic Approach," *Management Science*, 42 (February), 232-46.

Biggadike, Ralph (1977), "Entering New Markets: Strategies and Performance," Working Paper, 77-108. Cambridge, Mass: Marketing Science Institute.

Bitner, Mary Jo (1992), "Servicescapes: The Impact of Physical Surroundings on Customers and Employees," *Journal of Marketing*, 56 (April), 57-71.

Bloch, Peter H. (1995), "Seeking the Ideal Form: Product Design and Consumer Response," *Journal of Marketing*, 59 (July), 16-29.

_____, Frederic F. Brunel, and Todd J. Arnold (2003), "Individual Differences in the Centrality of Visual Product Aesthetics: Concept and Measurement," *Journal of Consumer Research*, 29 (March), 551-65.

Bonner, Joseph, Robert W. Ruskert, and Orville C. Walker, Jr. (2002), "Upper Management Control of New Product Development Projects and Project Performance," *Journal of Product Innovation Management*, 19, 233-45.

Booz-Allen and Hamilton (1982) *New Product Management for the 1980s*. New York: Booz-Allen and Hamilton Inc.

Bornstein, Robert. F. (1989), "Exposure and Affect: Overview and Meta-Analysis of Research," *Psychological Bulletin*, 106 (September), 265-89.

Boush, David M. (1993), "How Advertising Slogans Can Prime Evaluations of Brand Extensions," *Psychology and Marketing*, 10 (January/February), 67-78.

_____ and Barbara Loken (1991), "A Process-Tracing Study of Brand Extension Evaluation," *Journal of Marketing Research*, 28 (February), 16-28.

Breen, Bill (2004), "Masters of Design," *Fast Company*, (June), 61-62.

Broniarczyk, Susame M. and Joseph W. Alba (1994), "The Role of Consumers' Intuitions in Inference Making," *Journal of Consumer Research*, 21 (December), 393-407.

Byrne,John A. (2004), "Welcome to the Design Revolution," *Fast Company*, (June), 18.

Cacioppo, J. T., Richard E. Petty, and Chuan Feng Kao (1984), "The Efficient Assessment of Need for Cognition," *Journal of Personality Assessment*, 48 (June), 306-07.

_____, B. S. Marshall-Goodell, L. G. Tassinary, and R. E. Petty (1992), "Rudimentary Determinants of Attitudes: Classical Conditioning Is More Effective When Prior Knowledge About the Attitude Stimulus Is Low Than High," *Journal of Experimental Social Psychology*, 28, 207-33.

Calantone, Roger and Robert G. Cooper (1981), "New Product Scenarios: Prospects for Success," *Journal of Marketing,* 45 (Spring), 48-60.

Campbell, Margaret C. and Ronald C. Goodstein (2001), "The Moderating Effect of Perceived Risk on Consumers' Evaluations of Product Incongruity: Preference for the Norm," *Journal of Consumer Research*, 28 (December), 439-49.

Cantor, Gordon N. (1968), "Like-Dislike Ratings of Familiarized and Nonfamiliarized Visual Stimuli," *Journal of Experimental Child Psychology*, 6 (December), 651-57.

Carpenter, Gregory S., Rashi Glazer, and Kent Nakamoto (1994), "Meaningful Brands From Meaningless Differentiation: The Dependence on Irrelevant Attributes," *Journal of Marketing Research*, 31 (August), 339-50.

Chaiken, Shelley. (1987), The Heuristic Model of Persuasion," in *Social Influence: The Ontario Symposium*, Vol. 5, M. P. Zanna, J. M. Olson, and C. P. Herman, eds. Hillsdale, NJ: Erlbaum, 3-39.

_____, E. M. Pomerantz, and R. Giner-Sorolla (1993), "Structural Consistency and Attitude Strength," in *Attitude Strength: Antecedents and Consequences*, R. E. Petty and J. A. Krosnick, eds. Hillsdale, NJ: Erlbaum

Chandy, Rajesh K. and Gerard J Tellis (1998), "Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize," *Journal of Marketing Research*, 35 (November), 474-87.

Charlesworth, William R. (1969), "The Role of Surprise in Cognitive Development," in *Studies in Cognitive Development, Essays in Honor of Jean Piaget*, David Elkind and J H. Flavel, eds. London: Oxford University Press, 257-314.

Churchill, Gilbert A., Jr. (1979), "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research*, 26 (February), 64-73.

Cohen, Jacob and Patricia Cohen (1988) *Statistical Power Analysis for the Behavioral Sciences*. Hillside, NJ: Erlbaum Associates.

Cohen, Joel B. and Kanul Basu (1987), "Alternative Models of Categorization: Toward a Contingent Processing Framework," *Journal of Consumer Research*, 13 (March), 455-72.

Conners, C. (1964), "Visual and Verbal Approach Motives as a Function of Discrepancy from Expectancy Level," *Perceptual and Motor Skills*, 18, 457-64.

Cook, Thomas D. and Donald T. Campbell (1979), *Quasi-Experimentation Design and Analysis Issues for Field Settings*. Boston: Houghton Mifflin.

Cooper, Robert G. (1979), "The Dimensions of Industrial New Product Success and Failure," *Journal of Marketing*, 43 (Summer), 93-103.

_____ (1984), "How New Product Strategies Impact on Performance," *Journal of Product Innovation Management*, 1 (January), 5-18.

_____ (1993), *Winning at New Products*. New York: Addison-Wesley Publishing Company.

_____ (1996), "New Products: What Separates the Winners from Losers," in *The PDMA Handbook of New Product Development*, Milton D. Rosenau, ed. New York: John Wiley & Sons, 3-18.

_____ and E. J. Kleinschmidt (1987), "New Products: What Separates Winners from Losers," *Journal of Product Innovation Management,* 4, 169-84.

_____, Christopher J. Easingwood, Scott Edgett, Elko J. Kleinschmidt, and Chris Storey (1994), "What Distinguishes the Top Performing New Products in Financial Services," *Journal of Product Innovation Management*, 11, 281-99.

Cox, Dena and Anthony D. Cox (1988), "What Does Familiarity Breed? Complexity as a Moderator of Repetition Effects in Advertisement Evaluation," *Journal of Consumer Research*, 15 (June), 111-16.

_____ and _____ (2002), "Beyond First Impressions: The Effects of Repeated Exposure on Consumer Liking of Visually Complex and Simple Product Designs," *Journal of the Academy of Marketing Science*, 30 (2), 119-30.

Crawford, C. Merle (1977), "Marketing Research and the New Product Failure Rate," *Journal of Marketing*, 41 (April), 51-61.

Danneels, Erwin and Elko J. Kleinschmidt (2001), "Product Innovativeness from the Firm's Perspective: Its Dimensions and Their Relation with Project Selection and Performance," *Journal of Product Innovation Management*, 18 (November), 357-73.

Davis, Marian L. (1987), *Visual Design in Dress*. Englewood Cliffs, NJ: Prentice-Hall.

de Brentani, Ulrike (1989), "Success and Failure in New Industrial Services," *Journal of Product Innovation Management*, 6, 239-59.

DeRosa, Donna (2005), "Full Test: 2006 Volkswagen Passat 2.0T," *Edmunds.com*, < http://www.edmunds.com/apps/vdpcontainers/do/vdp/articleId=107889/pageNumber=1>, November 7.

Deshpande (1983), " 'Paradigms Lost': On Theory and Method in Research in Marketing," *Journal of Marketing*, 47 (Fall), 101-10.

Duncan, Calving and James E. Nelson (1985), "Effects of Humor in a Radio Advertising Experiment," *Journal of Advertising*, 14, 33-40.

Durgee, Jeffrey F. (1988), "Product Drama," *Journal of Advertising Research*, 28 (February/March), 42-49.

Eagly, Alice H. and Shelly Chaiken (1993), *The Psychology of Attitudes*. Fort Worth, TX: Harcourt, Brace, Jovanovich.

_____ and _____ (1998), "Attitude Structure and Function," in *Handbook of Social Psychology*, Vol. 1, D. Gilbert, S. Fiske, and G. Lindzey, eds. New York: McGraw-Hill, 269-322.

Edell, Julie A. and Richard Staelin (1983), "The Information Processing of Pictures in Print Advertisements," *Journal of Consumer Research*, 10 (June), 45-61.

Feather, N. T. (1967), "Attribution of Responsibility and Valence of Success and Failure in Relation to Initial Confidence and Task Performance," *Journal of Personality and Social Psychology*, 7, 129-44.

Firth, Richard W. and V. K. Narayanan (1996), "New Product Strategies of Large, Dominant Product Manufacturing Firms: An Exploratory Analysis," *Journal of Product Innovation Management*, 13, 334-47.

Fiske, Susan T. (1982), "Schema-Triggered Affect: Applications to Social Perception," in *Affect and Cognition: The 17th Annual Carnegie Symposium on Cognition*, Margaret S. Clark and Susan T. Fiske, eds. Hillsdale, NJ: Lawrence Erlbaum Associates, 55-78.

Garber, Lawrence L. Jr., R. R. Burke, and J.M. Jones (2000), *The Role of Package Appearance in Consumer Purchase Consideration and Choice*. Boston: Marketing Science Institute Working Paper Series.

_____, Eva M. Hyatt, and Richard G. Starr Jr. (2000), "The Effects of Food Color on perceived Flavor," *Journal of Marketing Theory and Practice*, Fall, 59-72.

Garcia, Rosanna and Roger Calantone (2002), "A Critical Look at Technological Innovation Typology and Innovativeness Terminology: A Literature Review," *The Journal of Product Innovation Management*, 19 (March), 110-32.

Gardner, Burleigh B. and Sidney J. Levy (1955), "The Product and the Brand," *Harvard Business Review*, 33 (March/April), 33-39.

Gatignon, Hubert and Thomas S. Robertson (1985), "A Propositional Inventory for New Diffusion Research," *Journal of Consumer Research*, 11 (March), 849-67.

_____ and Jean-Marc Xuereb (1997), "Strategic Orientation of the Firm and New Product Performance," *Journal of Marketing Research*, 34 (February), 77-90.

Gaver, William W. and George Mandler (1987), "Play It Again, Sam: On Liking Music," *Cognition and Emotion*, 1 (3), 259-82.

Gobeli, David H. and Daniel J. Brown (1987), "Analyzing Product Innovations," *Research Management*, (July/August), 25-31.

Graeff, Timothy R. (1996), "Image Congruence Effects on Product Evaluations: The Role of Self-Monitoring and Public/Private Consumption," *Psychology and Marketing*, 13 (August), 481-99.

Green, Stephen G. Mark B. Gavin, and Lynda Aiman-Smith (1995), "Assessing a Multidimensional Measure of Radical Technological Innovation," *IEEE Transactions on Engineering Management*, 42 (August), 203-14.

Griffin, Abbie (1997), "The Effect of Project and Process Characteristics on Product Development Cycle Time," *Journal of Marketing Research*, 34 (February), 24-35.

Hair, Joseph F., Rolph E. Anderson, Ronald L. Tatham, and William C. Black (1998), *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

_____, Robert P. Bush, and David J. Ortinau (2003), *Marketing Research: Within a Changing Information Environment*. Boston: McGraw-Hill/Irwin.

Hammonds, Keith H. (2002), "How to Design the Perfect Product Start with Craig Vogel and Jonathan Cagan, Integrate Style and Technology with a Dash of Fantasy. Apply to Everything from Toasters to Cars," *Fast Company*, (July), 123-26.

Henard, David H. and David M. Szymanski (2001), "Why Some New Products Are More Successful Than Others," *Journal of Marketing Research*, 38 (August), 362-75.

Holbrook, Morris and Robert B. Zirlin (1985), "Artistic Creation, Artworks, and Aesthetic Appreciation," *Advances in Non-Profit Marketing*, 1, 1-54.

Hultink, Erik Jan and Henry S. J. Robben (1995), "Measuring New Product Success: The Difference that Time Perspective Makes," *Journal of Product Innovation Management*, 12, 392-405.

Im, Subim and John P Workman Jr. (2004), "Market Orientation, Creativity, and New Product Performance in High-Tech Industry," *Journal of Marketing*, 68 (April), 114-32.

Jackson, Philip W. and Samuel Messick (1964), "The Person, the Product, and the Response: Conceptual Problems in the Assessment of Creativity," *Journal of Personality*, 33 (September), 309-29.

Janiszewski, Chris (1988), "Preconscious Processing Effects: The Independence of Attitude Formation and Conscious Thought," *Journal of Consumer Research*, 15 (September), 199-209.

_____ (1993), "Preattentive Mere Exposure Effects," *Journal of Consumer Research*, 20 (December), 376-92.

Kagan, Jerome (2002), *Surprise, Uncertainty, and Mental Structures*. Cambridge, MA: Harvard Business Press.

Kahneman, D. and D. T. Miller (1986), "Norm Theory: Comparing Reality to Its Alternatives," *Psychological Review*, 93, 136-53.

Kellaris, James J. and Robert J. Kent (1993), "Exploring Responses Elicited by Music Varying in Tempo, Tonality, and Texture," *Journal of Consumer Psychology*, 2 (4), 381-401.

Keller, Kevin Lane and David A. Aaker (1992), "The Effects of Sequential Introduction of Brand Extensions," *Journal of Marketing Research*, 29 (February), 35-50.

Kelman, H. C. (1958), "Compliance, Identification, and Internalization: Three Processes of Attitude Change," *Journal of Conflict Resolution*, 2, 51-60.

Kotler, Philip and G. Alexander Rath (1984), "Design: A Powerful But Neglected Strategic Tool," *Journal of Business Strategy*, 5 (Fall), 16-21.

Kuester, Sabine, Christian Homburg, and Thomas S. Robertson (1999), "Retaliatory Behavior to New Product Entry," *Journal of Marketing*, 63 (October), 90-106.

Leavitt, Clark and John Walton (1975), "Development of a Scale for Innovativeness," *Advances in Consumer Research*, 2 (1), 545-54.

Lee, Dong Hwan and Richard W. Olshavsky (1995), "Conditions and Consequences of Spontaneous Inference Generation: A Concurrent Protocol Approach," *Organizational Behavior and Human Decision Processes,* 61 (February), 177-89.

Levy, Sidney J. (1959), "Symbols for Sale," *Harvard Business Review*, 37 (July/August), 117-24.

Lewalski, Zdzislaw M. (1988), *Product Esthetics: An Interpretation for Designers*. Carson City, NV: Design and Development Engineering Press.

Li, Tiger and Roger J. Calantone (1998), "The Impact of Market Knowledge Competence on New Product Advantage: Conceptualization and Empirical Examination," *Journal of Marketing*, 62 (October), 13-29.

Link, Peter L. (1987), "Keys to New Product Success and Failure," *Industrial Marketing Management*, 16, 109-18.

Lorenz, C. (1986), *The Design Dimension: Product Strategy and the Challenge of Global Marketing*. Oxford, UK: Basil Blackwell.

Lynn, Gary S. and Ali E. Akgun (2001), "Project Visioning: Its Components and Impact on New Product Success," *The Journal of Product Innovation Management*, 18, 374-87.

_____, Joseph G. Monroe, and Albert S. Paulson (1996), "Marketing and Discontinuous Innovation: The Probe and Learn Process," *California Management Review*, 38 (Spring), 8-37.

Madhavan, Ravindranath and Rajiv Grover (1998), "From Embedded Knowledge to Embodied Knowledge: New Product Development as Knowledge Management," *Journal of Marketing*, 62 (October), 1-12.

Mahajan, Vijay, Eitan Muller, and Frank M. Bass (1990), "New Product Diffusion Models in Marketing: A Review and Directions for Research," *Journal of Marketing*, 54 (January), 1-25.

Mandler, George (1982), "The Structure of Value: Accounting for Taste," in *Affect and Cognition: The Seventeenth Annual Carnegie Symposium*, Margaret S. Clark and Susan T. Fiske, eds. Hillsdale, NJ: Erlbaum, 3-36.

McClelland, D. C., J. W. Atkinson, R. A. Clark, and E. L. Lowell (1953*), The Achievement Motive*. New York: Appleton-Century-Crofts.

Merriam-Webster (1998), *Merriam-Webster's Collegiate Dictionary*. Springfield, MA: Merriam-Webster, Inc.

Meyer, Marc H. and Edward B. Roberts (1986), "New Product Strategy in Small Technology-Based Firms: A Pilot Study," *Management Science*, 32 (July), 806-21.

Meyers-Levy, Joan and Alice M. Tybout (1989), "Schema Congruity as a Basis for Product Evaluation," *Journal of Consumer Research*, 16, 39-54.

Midgley, David F. and Grahame R. Dowling (1978), "Innovativeness: The Concept and Its Measurement," *Journal of Consumer Research*, 4 (March), 229-42.

Miniard, Paul and Joel B. Cohen (1979), "Isolating Attitudinal and Normative Influences in Behavioral Intentions Models," *Journal of Marketing Research*, 16 (February), 102-10.

Moreau, C. Page, Arthur B. Markman, and Donald R. Lehmann (2001), "'What Is it?' Categorization Flexibility and Consumers' Responses to Really New Products," *Journal of Consumer Research*, 27 (March), 489-98.

Mossberg, Walter S. (1999), "Two Apple Products Arrive for the Holidays, But Only One Delivers," *Wall Street Journal (Eastern edition)*, (December 16), B1.

Mukherjee, Ashesh (1998), "The Effect of Novel Attributes on Product Evaluation: Explaining Consumer Resistance to Technological Innovation," Ph.D. dissertation. The University of Texas at Austin.

_____ and Wayne D. Hoyer (2001), "The Effect of Novel Attributes on Product Evaluation," *Journal of Consumer Research*, 28 (December), 462-72.

Nunnally, Jum C. and Ira H. Bernstein (1994), *Psychometric Theory*. New York: McGraw-Hill.

Obermiller, Carl (1985), "Varieties of Mere Exposure: The Effects of Processing Style and Repetition on Affective Response," *Journal of Consumer Research*, 12 (June), 17-30.

Olshavsky, Richard W. and Richard A. Spreng (1996), "An Exploratory Study of the Innovation Evaluation Process," *Journal of Product Innovation Management*, 13, 512-29.

Olson, Eric M., Orville C. Walker, Jr., and Robert W. Ruekert (1995), "Organizing for Effective New Product Development: The Moderating Role of Product Innovativeness," *Journal of Marketing*, 59 (January), 48-62.

Ortony, Andrew, Gerald L. Clore, and Allan Collins (1988), *The Cognitive Structure of Emotions*, New York: Cambridge University Press.

Page, Albert L. and Harold F. Rosenbaum (1992), "Developing an Effective Concept Testing Program for Consumer Durables," *The Journal of Product Innovation Management*, 9 (December), 267-77.

Park, C. Whan and S. M. Young ((1986), "Consumer Response to Television Commercials: The Impact of Involvement and Background Music on Brand Attitude Formation," *Journal of Marketing Research*, 23, 11-24.

_____, Sandra Milberg, and Robert Lawson (1991), "Evaluation of Brand Extensions: The Role of Product Feature Similarity and Brand Concept Consistency," *Journal of Consumer Research*, 18 (September), 185-93.

Parry, Mark E. and X. Michael Song (1994), "Identifying New Product Successes in China," *Journal of Product Innovation Management*, 11, 15-30.

Petty, Richard E. and J. T. Cacioppo (1981), *Attitudes and Persuasion: Classic and Contemporary Approaches*, Dubuque, IA: Wm C. Brown.

_____ and _____ (1983), "The Role of Bodily Responses in Attitude Measurement and Change," in *Social Psychophysiology: A Sourcebook*, J. T. Cacioppo and R. E. Petty, eds. New York: Guilford Press, 51-101.

_____ and _____ (1984), "Source Factors and The Elaboration Likelihood Model of Persuasion," *Advances in Consumer Research*, 11, 668-72.

_____ and _____ (1986), "The Elaboration Likelihood Model of Persuasion," in *Advances in Experimental Social Psychology*, Vol. 19, L. Berkowitz, ed. San Diego, CA: Academic Press, 123-205.

_____ and Duane T. Wegener (1998), "Attitude Change: Multiple Roles for Persuasion Variables," in *Handbook of Social Psychology*, Vol. 1, D. Gilbert, S. Fiske, and G. Lindzey, eds. New York: McGraw-Hill, 323-90.

_____, John T. Cacioppo, and David Schumann (1983), "Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement," *Journal of Consumer Research*, 10 (September), 135-46.

_____, J. A. Kasmer, C. P. Haugtvedt, and J. T. Cacioppo (1987), "Source and Message Factors in Persuasion: A Reply to Stiff's Critique of the Elaboration Likelihood Model," *Communication Monographs*, 54, 233-49.

Power, Christopher, Kathleen Kerwin, Ronald Grover, and Keith Alexander (1993), "Flops: Too Many New Products Fail, Here's Why – and How to Do Better," *Business Week*, (August 16).

Robertson, Thomas S. and Hubert Gatignon (1986), "Competitive Effects on Technology Diffusion," *Journal of Marketing*, 50 (July), 1-12.

Robinson, William T. (1990), "Product Innovation and Start-Up Business Market Share Performance," *Management Science*, 36 (October), 1279-89.

Roehrich, Gilles (2004), "Consumer Innovativeness: Concepts and Measurments," *Journal of Business Research*, 57 (June), 671-77.

Rogers, Everett M. (1978), *Diffusion of Innovations*. New York: The Free Press.

_____ (1995), *Diffusion of Innovations*. New York: The Free Press.

Ryans, Adrian B. (1988), "Strategic Market Entry Factors and Market Share Achievement in Japan," *Journal of International Business Studies*, 19 (Fall), 389-409.

Sawyer, Alan G. (1981), "The Effects of Repetition and Levels of Processing on Learning and Attitudes," *Advances in Consumer Research*, 9 (1), 439-43.

Schwarz, Norbert and G. L. Clore (1983), "Mood, Misattribution, and Judgments of Well-Being: Informative and Directive Functions of Affective States," *Journal of Personality and Social Psychology*, 45, 513-23.

Sethi, Rajesh (2000), "New Product Quality and Product Development Teams," *Journal of Marketing*, 64 (April), 1-14.

_____, Daniel C. Smith, and C. Whan Park (2001), "Cross-Functional Product Development Teams, Creativity, and the Innovativeness of New Consumer Products," *Journal of Marketing Research*, 38 (February), 73-85.

Seward, J. P. and G. H. Seward (1934), "The Effect of Repetition on Reaction to Electric Shock," *Arch. Psychol.*, no. 168, 103.

Shankar, Venkatesh, Gregory S. Carpenter, and Lakshman Krishnamurthi (1998), "Late Mover Advantage: How Innovative Late Entrants Outsell Pioneers," *Journal of Marketing Research*, 35 (February), 54-70.

Shrivastava, Paul and William E. Souder (1987), "The Strategic Management of Technological Innovations: A Review and a Model," *Journal of Management Studies*, 24 (January), 25-41.

Simon, Herbert A. (1992), "What Is an 'Explanation' of Behavior?" *Psychological Science*, 3 (May), 150-61.

Solomon, Michael R. (1983), "The Role of Products as Social Stimuli: A Symbolic Interactionist Perspective," *Journal of Consumer Research*, 10 (December), 319-29.

Song, X. Michael and Mark E. Parry (1997), "A Cross-National Comparative Study of New Product Development Processes: Japan and the United States," *Journal of Marketing*, 61 (April), 1-18.

_____ and _____ (1999), "Challenges of Managing the Development of Breakthrough Products in Japan," *Journal of Operations Management*, 17 (November), 665-88.

Spangenberg, Eric R., Kevin E. Voss, and Ayn E. Crowley (1997), "Measuring the Hedonic and Utilitarian Dimensions of Attitude: A Generally Applicable Scale," *Advances in Consumer Research*, 24, 235-41.

Spector, A. J. (1956), "Expectations, Fulfillment, and Morale," *Journal of Abnormal and Social Psychology*, 52, 51-56.

Staats, A. W. and C. K. Staats (1958), "Attitudes Established by Classical Conditioning," *Journal of Abnormal and Social Psychology*, 57, 37-40.

Steenkamp, Jan-Benedict E. M. and Ktrijn Gielens (2003), "Consumer and Market Drivers of the Trial Probablity of New Consumer Packaged Goods," *Journal of Consumer Research*, 30 (December), 368-84.

Stern, B. L., D. M. Krugman, and A. Resnick (1981), "Magazine Advertising: An Analysis of Its Information Content," *Journal of Advertising Research*, 21 (April), 39-44.

Sujan, Mita (1985), "Effects on Evaluation Strategies Mediating Consumer Judgments," *Journal of Consumer Research*, 12 (June), 31-46.

Swink, Morgan (2000), "Technological Innovativeness as a Moderator of New Product Design Integration and Top Management Support," *Journal of Product Innovation Management*, 17, 208-20.

Szymanski, David M., Michael W. Kroff, and Lisa Troy (2006), "How Product Innovativeness Impacts Performance: A Meta-Analysis of the Research," Working paper.

Tatikonda, Mohan V. and Mitzi M. Montoya-Weiss (2001), "Integrating Operations and Marketing Perspectives of Product Innovation: The Influence of Organizational Process Factors and Capabilities on Development Performance," *Management Science*, 47 (January), 151-72.

Triandis, Harry C. (1980), "Values, Attitudes, and Interpersonal Behavior," in *Beliefs, Attitudes, and Values, Nebraska Symposium on Motivation*, Herbert E. Howe, Jr. and Monte M. Page, eds. Lincoln: University of Nebraska Press, 195-259.

Vanhamme, Joelle (2000), "The Link Between Surprise and Satisfaction: An Exploratory Research on How Best to Measure Surprise," *Journal of Marketing Management*, 16, 565-82.

_____ and Kirk Snelders (2001), "The Role of Surprise in Satisfaction Judgments," *Journal of Consumer Satisfaction, Dissatisfaction, and Complaining Behavior*, 14, 27-45.

Verinis, J. Scott, Jeffrey M. Brandsma, and Charles N. Cofer (1978), "Discrepancy from Expectation in Relation to Affect and Motivation: Tests of McClelland's Hypothesis," *Journal of Personality and Social Psychology*, 9, 47-58.

Veryzer, Robert W. (1993), "Aesthetic Response and the Influence of Design Principles on Product Preferences," in *Advances in Consumer Research*, Vol. 20, Leigh McAllister and Michael Rorthschild, eds. Provo, UT: Association for Consumer Research, 224-31.

_____ (1998), "Discontinuous Innovation and the New Product Development Process," *Journal of Product Innovation Management*, 15 (July), 304-21.

_____ and Wesley J. Hutchinson (1998), "The Influence of Unity and Prototypicality on Aesthetic Responses to New Product Designs," *Journal of Consumer Research*, 24 (March), 374-84.

Voss, Kevin E., Eric R. Spangenberg, and Bianca Grohmann (2003), "Measuring the Hedonic and Utilitarian Dimensions of Consumer Attitude," *Journal of Marketing Research*, 40 (August), 310-20.

Wilson, N. J. and W. P. Wilson (1959), "The Duration of Human Electroencephelographic Arousal Responses Elicited by Photic Stimulation," *EEG Clin. Neurophysicol*., 11, 85-91.

Wilson, William R. (1979), "Feeling More Than We Can Know: Exposure Effects Without Learning," *Journal of Personality and Social Psychology*, 37 (June), 811-21.

Woodworth, R. S. (1938), *Experimental Psychology*. New York: Holt.

Yap, Chee Meng and Wm. E. Souder (1994), "Factors Influencing New Product Success and Failure in Small Entrepreneurial High-Technology Electronics Firms," *Journal of Product Innovation Management*, 11, 418-32.

Zajonc, Robert B. (1968), "Attitudinal Effects of Mere Exposure," *Journal of Personality and Social Psychology*, 9 (No. 2, Pt. 2).

_____ (1980), "Feeling and Thinking: Preferences Need No Inference," *American Psychologist*, 35 (February), 151-75.

_____ (1984), "On the Primacy of Affect," *American Psychologist*, 39 (February), 117-23.

APPENDIX A-1

ILLUSTRATION OF PRODUCT THAT IS INNOVATIVE IN BOTH FORM AND FUNCTION AND IN WHICH FORM INNOVATIVENESS IS EXPECTED

- New steam iron that preheats water for dripless steaming
- Standard size and weight
- Multiple temperature settings

APPENDIX A-2

ILLUSTRATION OF FUNCTIONALLY INNOVATIVE PRODUCT IN WHICH FUNCTION INNOVATIVENESS IS EXPECTED

- New steam iron that preheats water for dripless steaming
- Standard size and weight
- Multiple temperature settings

APPENDIX A-3

ILLUSTRATION OF PRODUCT THAT IS INNOVATIVE IN BOTH FORM AND FUNCTION AND IN WHICH FORM INNOVATIVENESS IS UNEXPECTED

- New hand vacuum that performs as steamer or wet/dry vac
- Standard size and weight
- Compact for storage

APPENDIX A-4

ILLUSTRATION OF FUNCTIONALLY INNOVATIVE PRODUCT IN WHICH FUNCTION INNOVATIVENESS IS EXPECTED

- New hand vacuum that performs as steamer or wet/dry vac
- Standard size and weight
- Compact for storage

APPENDIX A-5

ILLUSTRATION OF PRODUCT THAT IS INNOVATIVE IN BOTH FORM AND FUNCTION AND IN WHICH FUNCTION IS UNEXPECTED

- New picture frame with LCD screen for digital picture display
- Durable frame material
- Includes both a stand and metal hooks for wall hanging

APPENDIX A-6

ILLUSTRATION OF FUNCTIONALLY INNOVATIVE PRODUCT IN WHICH FUNCTION INNOVATIVENESS IS UNEXPECTED

- New picture frame with LCD screen for digital picture display
- Durable frame material
- Includes both a stand and metal hooks for wall hanging

APPENDIX A-7

ILLUSTRATION OF PRODUCT THAT IS INNOVATIVE IN BOTH FORM AND FUNCTION AND IN WHICH FUNCTION INNOVATIVENESS IS UNEXPECTED

- New desk lamp with light-diffusing grill to reduce glare
- Standard size
- Low heat generation

APPENDIX A-8

ILLUSTRATION OF FUNCTIONALLY INNOVATIVE PRODUCT IN WHICH FUNCTION INNOVATIVENESS IS UNEXPECTED

- New desk lamp with light-diffusing grill to reduce glare
- Standard size
- Low heat generation

APPENDIX B

SCALES OF ATTITUDES AND BEHAVIORAL INTENTIONS

Overall Attitude

Please rate your attitude toward the product you just saw on each of the following scales.

1	2	3	4	5	6	7
Bad						Good
1	2	3	4	5	6	7
Unfavorable						Favorable

Hedonic Attitude

Please rate your assessment of this product on the following scales.

1	2	3	4	5	6	7
Not Fun						Fun
1	2	3	4	5	6	7
Dull						Exciting
1	2	3	4	5	6	7
Not Delightful						Delightful
1	2	3	4	5	6	7
Not Thrilling						Thrilling
1	2	3	4	5	6	7
Unenjoyable						Enjoyable

Utilitarian Attitude

Please rate your assessment of this product on the following scales.

1	2	3	4	5	6	7
Ineffective						Effective
1	2	3	4	5	6	7
Unhelpful						Helpful
1	2	3	4	5	6	7
Unnecessary						Necessary
1	2	3	4	5	6	7
Impractical						Practical

Behavioral Intention

Assuming you needed to purchase this product and the price did not matter, answer the following questions based on the probability that you would purchase this particular model that you just saw.

1	2	3	4	5	6	7
Unlikely						Likely

1	2	3	4	5	6	7
Impossible						Possible

APPENDIX C

SCALES FOR POSSIBLE COVARIATES

Need for Cognition (NFC)

1. I would prefer complex to simple problems.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. I like to have the responsibility of handling a situation that requires a lot of thinking.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. Thinking is not my idea of fun.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

6. I find satisfaction in deliberating hard for long hours.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

7. I only think as hard as I have to.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

8. I prefer to think about small, daily projects to long-term ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. I like tasks that require little thought once I've learned them.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

10. The idea of relying on thought to make my way to the top appeals to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

11. I really enjoy a task that involves coming up with new solutions to problems.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

12. Learning new ways to think doesn't excite me very much.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

13. I prefer my life to be filled with puzzles that I must solve.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

14. The notion of thinking abstractly is appealing to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

17. It's enough for me that something gets the job done; I don't care how or why it works.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

18. I usually end up deliberating about issues even when they do not affect me personally.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Centrality of Visual Product Aesthetics (CVPA)

1. I enjoy seeing displays of products that have superior designs.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. A product's design is a source of pleasure for me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. Beautiful product designs make our world a better place to live.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. Being able to see subtle differences in product designs is one skill that I have developed over time.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. I see things in a product's design that other people tend to pass over.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

6. I have the ability to imagine how a product will fit in with designs of other things I already own.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

7. I have a pretty good idea of what makes one product look better than its competitors.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

8. Sometimes the way a product looks seems to reach out and grab me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. If a product's design really "speaks" to me, I feel that I must buy it.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

10. When I see a product that has a really great design, I feel a strong urge to buy it.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

11. Owning products that have superior designs makes me feel good about myself.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Personal Innovativeness

1. I like to take a chance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. I don't like to talk to strangers.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. I enjoy looking at new styles as soon as they come out.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. The unusual gift is often a waste of money.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. Often, the most interesting and stimulating people are those who don't mind being original and different.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

6. Buying a new product that has not yet been proven is usually a waste of time and money.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

7. I would like a job that required frequent changes from one kind of task to another.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

8. If people would quit wasting their time experimenting, we would get more accomplished.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. I like to try new and different things.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

10. If I got an idea, I would give a lot of weight to what others think of it.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

11. I like people who are a little shocking.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

12. In hunting for the best way to do something, it is usually a good idea to try the obvious first.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

13. When I see a new brand on the shelf, I often buy it just to see what it's like.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

14. I like to wait until something has been proven before I try it.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

15. I often try new brands before my friends and neighbors do.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

16. When it comes to taking chances, I'd rather be safe than sorry.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

17. I like to experiment with new ways of doing things.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

18. I feel that too much money is wasted on new styles.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

19. Some modern art is stimulating.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

20. I enjoy being with people who think like I do.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

21. I like to fool around with new ideas even if they turn out later to be a total waste of time.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

22. I think everybody should work on only one thing in detail, so that they become experts.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

23. Today is a good day to start a new project.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

24. In the long run, the usual ways of doing things are the best.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

APPENDIX D

A COPY OF THE QUESTIONNAIRE AS VIEWED BY STUDY PARTICIPANTS

Please rate the degree to which you agree with the following statements regarding the hand vacuum category.

1. New features in hand vacuum category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the hand vacuum category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the hand vacuum category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the hand vacuum category to be related to product performance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate the degree to which you agree with the following staments regarding the desk lamp category.

1. New features in the desk lamp category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the desk lamp category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the desk lamp category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the desk lamp category to be related to product performance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate the degree to which you agree with the following staments regarding the steam iron category.

1. New features in the steam iron category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the steam iron category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the steam iron category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the steam iron category to be related to product performance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate the degree to which you agree with the following statements regarding the picture frame category.

1. New features in the picture frame category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the picture frame category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the picture frame category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the picture frame category to be related to product performance.

During the next portion of this survey, you will be evaluating two products from the product categories mentioned above. To begin this comparison, please minimize this survey and open the file "product 1" from the desktop. Take a few moments to evaluate the product. Once you have evaluated the product, maximize this survey and continue.

1. What is the product that you just saw?

_____

Please rate your attitude toward the product you just saw on each of the following scales.

1	2	3	4	5	6	7
Bad						Good

1	2	3	4	5	6	7
Unfavorable						Favorable

Please rate your assessment of this product on the following scales.

1	2	3	4	5	6	7
Not Fun						Fun

1	2	3	4	5	6	7
Dull						Exciting

1	2	3	4	5	6	7
Not Delightful						Delightful

1	2	3	4	5	6	7
Not Thrilling						Thrilling

1	2	3	4	5	6	7
Unenjoyable						Enjoyable

1	2	3	4	5	6	7
Ineffective						Effective

1	2	3	4	5	6	7
Unhelpful						Helpful

1	2	3	4	5	6	7
Unnecessary						Necessary

1	2	3	4	5	6	7
Impractical						Practical

11. How certain are you regarding your attitude toward this product?

1	2	3	4	5	6	7
Not at all Certain						Very Certain

12. How confident are you in your attitude toward this product?

1	2	3	4	5	6	7
Not at All Confident						Very Confident

Please rate the product you just saw on the scales below

1	2	3	4	5	6	7
Old						New

1	2	3	4	5	6	7
Unoriginal						Original

1	2	3	4	5	6	7
Common						Unusual

1	2	3	4	5	6	7
Familiar						Novel

1	2	3	4	5	6	7
Typical						Atypical

1	2	3	4	5	6	7
Not Complex in Design						Complex in Design

1	2	3	4	5	6	7
Simple in Design						Complicated in in Design

Assuming you needed to purchase this product and the price did not matter, answer the following questions based on the probability that you would purchase this particular model that you just saw.

1	2	3	4	5	6	7
Unlikely						Likely

1	2	3	4	5	6	7
Impossible						Possible

Assuming a person who frequently uses this product needed to purchase a new one and the price did not matter, answer the following questions based on the probability that he/she would purchase this particular model that you just saw.

1	2	3	4	5	6	7
Unlikely						Likely

1	2	3	4	5	6	7
Impossible						Possible

Thinking about the product you just saw, please indicate your level of agreement with the following statements.

1. The new feature that this product possesses will allow it to perform a new function.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. There is newness in this product that can be visually identified.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. There is a functional benefit from the new feature that this product possesses.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. There is something distinctive about the way this product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate this product based on how well you think its following features perform.

1. Visual design

1-	2	3	4	5	6	7
Not Well at All						Very Well

2. Preheated water

1-	2	3	4	5	6	7
Not Well at All						Very Well

3. Appropriate Size

1-	2	3	4	5	6	7
Not Well at All						Very Well

4. Temperature settings

1-	2	3	4	5	6	7
Not Well at All						Very Well

Please rate the importance of each of the following attributes in your evaluation of this steam iron.

1. Visual design

1	2	3	4	5	6	7
Not at All Important						Very Important

2. Preheated water

1	2	3	4	5	6	7
Not at All Important						Very Important

3. Appropriate Size

1	2	3	4	5	6	7
Not at All Important						Very Important

4. Temperature settings

1	2	3	4	5	6	7
Not at All Important						Very Important

How would someone who frequently uses a steam iron rate the importance of each of the following attributes in his/her evaluation of this particular steam iron?

1. Visual design

1	2	3	4	5	6	7
Not at All Important						Very Important

2. Preheated water

1	2	3	4	5	6	7
Not at All Important						Very Important

3. Appropriate Size

1	2	3	4	5	6	7
Not at All Important						Very Important

4. Temperature settings

1	2	3	4	5	6	7

PRODUCT 2- EVALUATION

Prior to continuing this survey, please minimize it and open the file "product 2" from the desktop. Take a few minutes to evaluate the product. Once you have evaluated the product, maximize this survey and continue.

1. What is the product you just saw?

_____

Please rate your attitude toward the product you just saw on each of the following scales.

1	2	3	4	5	6	7
Bad						Good

1	2	3	4	5	6	7
Unfavorable						Favorable

Please rate your assessment of this product on the following scales.

1	2	3	4	5	6	7
Not Fun						Fun

1	2	3	4	5	6	7
Dull						Exciting

1	2	3	4	5	6	7
Not Delightful						Delightful

1	2	3	4	5	6	7
Not Thrilling						Thrilling

1	2	3	4	5	6	7
Unenjoyable						Enjoyable

1	2	3	4	5	6	7
Ineffective						Effective

1	2	3	4	5	6	7

Unhelpful						Helpful
1	2	3	4	5	6	7
Unnecessary						Necessary
1	2	3	4	5	6	7
Impractical						Practical

11. How certain are you regarding your attitude toward this product?

1	2	3	4	5	6	7
Not at all Certain						Very Certain

12. How confident are you in your attitude toward this product?

1	2	3	4	5	6	7
Not at All Confident						Very Confident

Please rate the product you just saw on the scales below

1	2	3	4	5	6	7
Old						New
1	2	3	4	5	6	7
Unoriginal						Original
1	2	3	4	5	6	7
Common						Unusual
1	2	3	4	5	6	7
Familiar						Novel
1	2	3	4	5	6	7
Typical						Atypical
1	2	3	4	5	6	7
Not Complex in Design						Complex in Design
1	2	3	4	5	6	7
Simple in Design						Complicated in in Design

Assuming you needed to purchase this product and the price did not matter, answer the following questions based on the probability that you would purchase this particular model that you just saw.

1	2	3	4	5	6	7
Unlikely						Likely
1	2	3	4	5	6	7
Impossible						Possible

Assuming a person who frequently uses this product needed to purchase a new one and the price did not matter, answer the following questions based on the probability that he/she would purchase this particular model that you just saw.

1	2	3	4	5	6	7
Unlikely						Likely

1	2	3	4	5	6	7
Impossible						Possible

Thinking about the product you just saw, please indicate your level of agreement with the following statements.

1. The new feature that this product possesses will allow it to perform a new function.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. There is newness in this product that can be visually identified.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. There is a functional benefit from the new feature that this product possesses.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. There is something distinctive about the way this product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate this product based on how well you think its following features perform.

1. Visual design

1	2	3	4	5	6	7
Not at All Well						Very Well

2. Steamer and wet/dry vac options

1	2	3	4	5	6	7
Not at All Well						Very Well

3. Size and weight

1	2	3	4	5	6	7
Not at All Well						Very Well

4. Storage capability

1	2	3	4	5	6	7
Not at All Well						Very Well

Please rate the importance of each of the following attributes in your evaluation of this hand vacuum.

1. Visual design

1	2	3	4	5	6	7
Not at All important						Very Important

2. Steamer and wet/dry vac options

1	2	3	4	5	6	7
Not at All important						Very Important

3. Size and weight

1	2	3	4	5	6	7
Not at All important						Very Important

4. Storage capability

1	2	3	4	5	6	7
Not at All important						Very Important

How would someone who frequently uses a hand vacuum rate the importance of each of the following attributes in his/her evaluation of this particular hand vacuum?

1. Visual design

1	2	3	4	5	6	7

Not at All important						Very Important

2. Steamer and wet/dry vac options

1	2	3	4	5	6	7
Not at All important						Very Important

3. Size and weight

1	2	3	4	5	6	7
Not at All important						Very Important

4. Storage capability

1	2	3	4	5	6	7
Not at All important						Very Important

Before continuing with your evaluation of these products, please indicate the extent to which each statement accurately describes you.

1. I like to take a chance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. I don't like to talk to strangers.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. I enjoy looking at new styles as soon as they come out.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. The unusual gift is often a waste of money.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. Often, the most interesting and stimulating people are those who don't mind being original and different.

1	2	3	4	5	6	7

Strongly Disagree — Strongly Agree

6. Buying a new product that has not yet been proven is usually a waste of time and money.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

7. I would like a job that required frequent changes from one kind of task to another.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

8. If people would quit wasting their time experimenting, we would get more accomplished.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

9. I like to try new and different things.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

10. If I got an idea, I would give a lot of weight to what others think of it.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

11. I like people who are a little shocking.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

12. In hunting for the best way to do something, it is usually a good idea to try the obvious first.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

13. When I see a new brand on the shelf, I often buy it just to see what it's like.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

14. I like to wait until something has been proven before I try it.

1 2 3 4 5 6 7

Strongly Disagree — Strongly Agree

15. I often try new brands before my friends and neighbors do.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

16. When it comes to taking chances, I'd rather be safe than sorry.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

17. I like to experiment with new ways of doing things.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

18. I feel that too much money is wasted on new styles.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

19. Some modern art is stimulating.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

20. I enjoy being with people who think like I do.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

21. I like to fool around with new ideas even if they turn out later to be a total waste of time.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

22. I think everybody should work on only one thing in detail, so that they become experts.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

23. Today is a good day to start a new project.

1 2 3 4 5 6 7

Strongly Disagree — Strongly Agree

24. In the long run, the usual ways of doing things are the best.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

Please indicate the degree to which each of the following statements accurately describes you.

1. I would prefer complex to simple problems.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

2. I like to have the responsibility of handling a situation that requires a lot of thinking.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

3. Thinking is not my idea of fun.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

5. I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

6. I find satisfaction in deliberating hard for long hours.

1 2 3 4 5 6 7
Strongly Disagree — Strongly Agree

7. I only think as hard as I have to.

1 2 3 4 5 6 7

Strongly Disagree						Strongly Agree

8. I prefer to think about small, daily projects to long-term ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. I like tasks that require little thought once I've learned them.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

10. The idea of relying on thought to make my way to the top appeals to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

11. I really enjoy a task that involves coming up with new solutions to problems.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

12. Learning new ways to think doesn't excite me very much.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

13. I prefer my life to be filled with puzzles that I must solve.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

14. The notion of thinking abstractly is appealing to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.

1	2	3	4	5	6	7

Strongly Disagree						Strongly Agree

17. It's enough for me that something gets the job done; I don't care how or why it works.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

18. I usually end up deliberating about issues even when they do not affect me personally.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Now let's return to evaluating the iron that you saw previously. This time, DO NOT look at the iron. Instead, take a few moments to think about it. Then, continue with the survey. You will be answering many of the same questions you were asked after your first evaluation.

Please rate your attitude toward this iron on each of the following scales.

1	2	3	4	5	6	7
Bad						Good

1	2	3	4	5	6	7
Unfavorable						Favorable

Please rate your assessment of this iron on the following scales.

1	2	3	4	5	6	7
Not Fun						Fun

1	2	3	4	5	6	7
Dull						Exciting

1	2	3	4	5	6	7
Not Delightful						Delightful

1	2	3	4	5	6	7
Not Thrilling						Thrilling

1	2	3	4	5	6	7
Unenjoyable						Enjoyable

1	2	3	4	5	6	7
Ineffective						Effective

1	2	3	4	5	6	7
Unhelpful						Helpful

1	2	3	4	5	6	7
Unnecessary						Necessary

1	2	3	4	5	6	7
Impractical						Practical

11. How certain are you regarding your attitude toward this product?

1	2	3	4	5	6	7
Not at all Certain						Very Certain

12. How confident are you in your attitude toward this product?

1	2	3	4	5	6	7
Not at All Confident						Very Confident

Next, please rate this iron on the scales below

1	2	3	4	5	6	7
Old						New

1	2	3	4	5	6	7
Unoriginal						Original

1	2	3	4	5	6	7
Common						Unusual

1	2	3	4	5	6	7
Familiar						Novel

1	2	3	4	5	6	7
Typical						Atypical

1	2	3	4	5	6	7
Not Complex in Design						Complex in Design

1	2	3	4	5	6	7
Simple in Design						Complicated in in Design

Assuming you needed to purchase this product and the price did not matter, answer the following questions based on the probability that you would purchase this particular model after this second evaluation.

1	2	3	4	5	6	7
Unlikely						Likely

1	2	3	4	5	6	7
Impossible						Possible

Thinking about this iron, please indicate your level of agreement with the following statements.

1. The new feature that this product possesses will allow it to perform a new function.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. There is newness in this product that can be visually identified.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. There is a functional benefit from the new feature that this product possesses.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. There is something distinctive about the way this product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate this iron based on how well you think its following features perform.

1. Visual design

1-	2	3	4	5	6	7
Not Well at All						Very Well

2. Preheated water

1-	2	3	4	5	6	7
Not Well at All						Very Well

3. Appropriate Size

1-	2	3	4	5	6	7
Not Well at All						Very Well

4. Temperature settings

1-	2	3	4	5	6	7
Not Well at All						Very Well

Please rate the importance of each of the following attributes in your second evaluation of this steam iron.

1. Visual design

1	2	3	4	5	6	7
Not at All Important						Very Important

2. Preheated water

1	2	3	4	5	6	7
Not at All Important						Very Important

3. Appropriate Size

1	2	3	4	5	6	7
Not at All Important						Very Important

4. Temperature settings

1	2	3	4	5	6	7
Not at All Important						Very Important

Now, take a few minutes to think about the hand vac that you evaluated previously. This time, DO NOT look at it. After you have taken time to think about the hand vac a second time, continue with the survey. Again, you will be answering many of the same questions you were asked after your first evaluation.

Please rate your attitude toward this hand vac on each of the following scales.

1	2	3	4	5	6	7
Bad						Good

1	2	3	4	5	6	7
Unfavorable						Favorable

Please rate your assessment of this hand vac on the following scales.

1	2	3	4	5	6	7
Not Fun						Fun

1	2	3	4	5	6	7
Dull						Exciting

1	2	3	4	5	6	7
Not Delightful						Delightful

1	2	3	4	5	6	7
Not Thrilling						Thrilling

1	2	3	4	5	6	7
Unenjoyable						Enjoyable

1 Ineffective	2	3	4	5	6	7 Effective
1 Unhelpful	2	3	4	5	6	7 Helpful
1 Unnecessary	2	3	4	5	6	7 Necessary
1 Impractical	2	3	4	5	6	7 Practical

11. How certain are you regarding your attitude toward this product?

1 Not at all Certain	2	3	4	5	6	7 Very Certain

12. How confident are you in your attitude toward this product?

1 Not at All Confident	2	3	4	5	6	7 Very Confident

Please rate this hand vac on the scales below

1 Old	2	3	4	5	6	7 New
1 Unoriginal	2	3	4	5	6	7 Original
1 Common	2	3	4	5	6	7 Unusual
1 Familiar	2	3	4	5	6	7 Novel
1 Typical	2	3	4	5	6	7 Atypical
1 Not Complex in Design	2	3	4	5	6	7 Complex in Design
1 Simple in Design	2	3	4	5	6	7 Complicated in in Design

Assuming you needed to purchase a hand vac and the price did not matter, answer the following questions based on the probability that you would purchase this particular model after this second evaluation.

1	2	3	4	5	6	7
Unlikely						Likely

1	2	3	4	5	6	7
Impossible						Possible

Thinking about this hand vac, please indicate your level of agreement with the following statements.

1. The new feature that this product possesses will allow it to perform a new function.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. There is newness in this product that can be visually identified.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. There is a functional benefit from the new feature that this product possesses.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. There is something distinctive about the way this product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate this hand vac based on how well you think its following features perform.

1. Visual design

1	2	3	4	5	6	7
Not at All Well						Very Well

2. Steamer and wet/dry vac options

1	2	3	4	5	6	7
Not at All Well						Very Well

3. Size and weight

1	2	3	4	5	6	7
Not at All Well						Very Well

4. Storage capability

1	2	3	4	5	6	7
Not at All Well						Very Well

Please rate the importance of each of the following attributes in your second evaluation of this hand vacuum.

1. Visual design

1	2	3	4	5	6	7
Not at All important						Very Important

2. Steamer and wet/dry vac options

1	2	3	4	5	6	7
Not at All important						Very Important

3. Size and weight

1	2	3	4	5	6	7
Not at All important						Very Important

4. Storage capability

1	2	3	4	5	6	7
Not at All important						Very Important

Please indicate the extent to which each of the following statements accurately describes you.

1. Compared to other products, a steam iron is important to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. If I needed to buy a steam iron, I would choose very carefully.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate your knowledge of steam irons on the following scales.

1	2	3	4	5	6	7
Not Knowledgeable						Knowledgeable

1	2	3	4	5	6	7
Inexpert						Expert

1	2	3	4	5	6	7
Uniformed						Experienced

1. Have you seen this particular steam iron prior to participating in this study?

Yes No

2. Did you notice the brand of the steam iron that you evaluated?

Yes No

3. Please type the name of the brand if you noticed it.

4. If you listed the brand name, please indicate your liking of this brand on the scale below.

1	2	3	4	5	6	7
Very Unfavorable						Very Favorable

Please indicate the extent to which each of the following statements accurately describes you.

1. Compared to other products, a hand vacuum is important to me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. If I needed to buy a hand vacuum, I would choose very carefully.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate your knowledge of hand vacuums on the following scales.

1	2	3	4	5	6	7
Not Knowledgeable						Knowledgeable

1	2	3	4	5	6	7
Inexpert						Expert

1	2	3	4	5	6	7
Uniformed						Experienced

1. Have you seen this particular hand vacuum prior to participating in this study?

Yes No

2. Did you notice the brand of the hand vacuum that you evaluated?

Yes No

3. Please type the name of the brand if you noticed it.

4. If you listed the brand name, please indicate your liking of this brand on the scale below.

1	2	3	4	5	6	7
Very Unfavorable						Very Favorable

Please rate yourself based on your agreement with the following statements.

1. I enjoy seeing displays of products that have superior designs.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. A product's design is a source of pleasure for me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. Beautiful product designs make our world a better place to live.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. Being able to see subtle differences in product designs is one skill that I have developed over time.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. I see things in a product's design that other people tend to pass over.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

6. I have the ability to imagine how a product will fit in with designs of other things I already own.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

7. I have a pretty good idea of what makes one product look better than its competitors.

1	2	3	4	5	6	7

Strongly Disagree						Strongly Agree

8. Sometimes the way a product looks seems to reach out and grab me.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. If a product's design really "speaks" to me, I feel that I must buy it.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

10. When I see a product that has a really great design, I feel a strong urge to buy it.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

11. Owning products that have superior designs makes me feel good about myself.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please provide the following demographic information:

1. Gender

Male Female

2. Current year of study

Freshman Sophomore Junior Senior

3. Please enter your major

4. Please enter your age

APPENDIX E

SURVEY QUESTIONS ASSESSING EXPECTED INNOVATIVENESS OF EXPERIMENTAL STIMULI

Please rate the degree to which you agree with the following statements regarding the hand vacuum category.

1. New features in hand vacuum category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the hand vacuum category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the hand vacuum category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the hand vacuum category to be related to product performance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate the degree to which you agree with the following statements regarding the desk lamp category.

1. New features in the desk lamp category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the desk lamp category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the desk lamp category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the desk lamp category to be related to product performance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate the degree to which you agree with the following statements regarding the steam iron category.

1. New features in the steam iron category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the steam iron category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the steam iron category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the steam iron category to be related to product performance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

Please rate the degree to which you agree with the following statements regarding the picture frame category.

1. New features in the picture frame category are commonly related to the product's appearance.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. New features in the picture frame category generally add new functions or improve existing ones.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. When evaluating a new product in the picture frame category, a person would typically expect newness in the way the product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. A person would typically expect new product features in the picture frame category to be related to product performance.

APPENDIX F

SURVEY QUESTIONS ASSESSING ACTUAL FORM INNOVATIVENESS OF EXPERIMENTAL STIMULI

1. The new feature that this product possesses will allow it to perform a new function.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

2. There is newness in this product that can be visually identified.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. There is a functional benefit from the new feature that this product possesses.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. There is something distinctive about the way this product looks.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

VITA

Name:	Michael William Kroff
Address:	341 Reid Hall, Montana State University, Bozeman, MT 59717
Email Address:	mkroff@montana.edu
Education:	B.S., Psychology, Brigham Young University, 1992 M.B.A., Brigham Young University, 1998 Ph.D., Marketing, Texas A&M University, 2006